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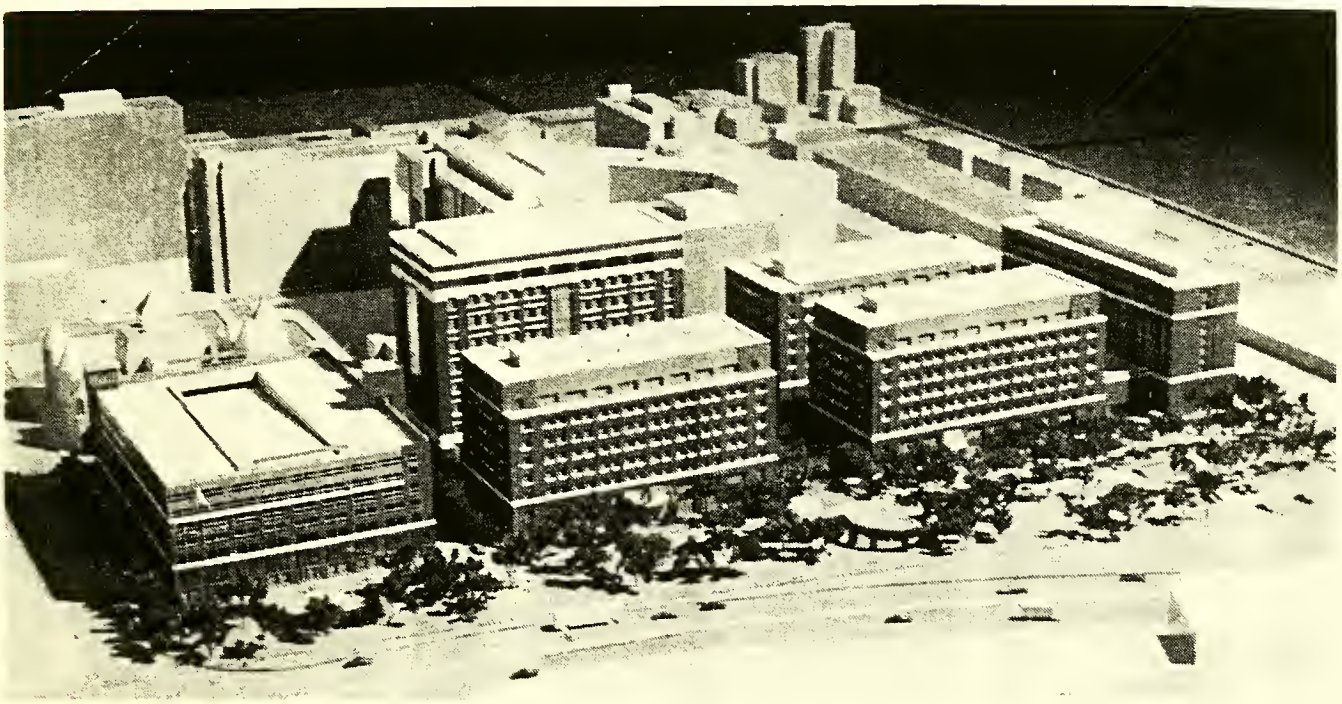
Final Project Impact Report



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Submitted To:

Boston Redevelopment Authority

Proponent:

University Associates
Boston, MA

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As of November 1991

UNIVERSITY ASSOCIATES

FINAL PROJECT IMPACT REPORT

As of November 1991

Proponent:

UNIVERSITY ASSOCIATES
BOSTON, MA

Environmental Consultant:

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1.0 PROJECT SUMMARY

1.0 PROJECT SUMMARY

1.1 PROJECT NAME

University Associates
624 - 710 Albany Street
Boston, MA 02118

This document serves as a Final Project Impact Report (FPIR) under Article 31 of the Boston Zoning Code. The FPIR document responds to the Preliminary Adequacy Determination issued on the University Associates project dated October 18, 1991 and provides responses to comment letters submitted on the Draft Environmental Impact Report/Project Impact Report (DPIR).

A combined Draft Environmental Impact Report/Draft Project Impact Report (DPIR) was submitted to MEPA and the Boston Redevelopment Authority on May 15, 1991 addressing all issues identified in the Certificate on the Environmental Notification Form (ENF), as well as those additional items required by the Boston Redevelopment Authority under Article 31. A Final Environmental Impact Report (FEIR) was filed with MEPA on August 15, 1991 and a final Certificate on the FEIR for the University Associates project was issued by the Secretary of Environmental Affairs on September 30, 1991.

1.2 SUMMARY PROJECT DESCRIPTION

1.2.1 INTRODUCTION

The University Associates project is a mixed-use development designed to provide for the long term needs of the Boston University Medical Center for expanded and upgraded medical research and office space. The project includes the construction of four medical research/office buildings, a 250 room hotel and a 1,000 car parking garage which is programmed over a ten year development timeframe.

The University Associates project is located at 624 - 710 Albany Street in the South End, a section of Boston which has been the locus of medical and institutional uses since the 1860s. A number of medical services, educational institutions, and hospitals are located in the area. The Boston University Medical Center includes the Boston University School of Medicine, the Boston University Henry Goldman

School of Graduate Dentistry, the Boston University School of Public Health, and The University Hospital. Also nearby are the Boston City Hospital facilities and the Dr. Solomon Carter Fuller Mental Health Center.

Boston University Medical Center (BUMC) was created in the 1960s when University Hospital and Boston University joined together for the purpose of developing "... an integrated and coordinated program of education, research and health service for the purpose of providing and maintaining better health in contemporary society..." with the conviction that by joining resources the "...basic objectives of teaching, of research, of patient care and of community health can be met more fully and effectively." Today, BUMC includes approximately 11 acres with 1.6 million square feet of space. The complex employs approximately 4,000 people, about 1,400 of whom are residents of Boston.

Since its inception, BUMC has worked closely and successfully with the community in its planning and expansion projects. As a result, BUMC enjoys considerable support for its programs and services. See Appendix C, History of the Boston University Medical Center, for further information.

The planning objectives for the site are to create a medical/research campus in the South End. The University Associates project will promote quality research facilities adjacent to the existing medical institutions. The new campus provides supporting office space and a hotel to service the existing medical institutions as well as the new facilities.

BUMC continues to work closely with the community and City officials in planning for improvements which would achieve the following goals:

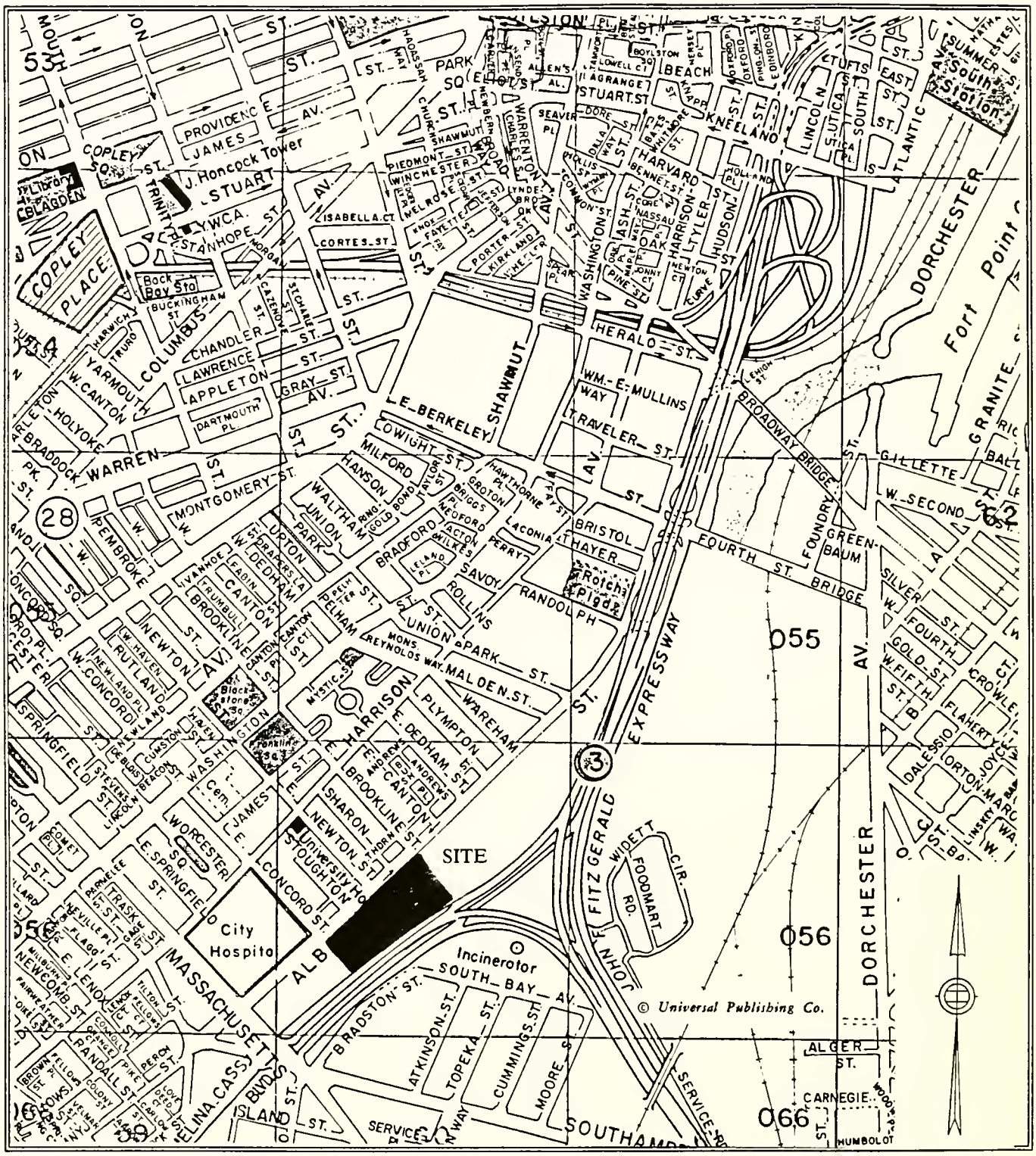
- Create a unified environment in the complex.
- Create a more "legible" medical complex with a cohesive building image for the area.
- Reduce dependence on leased space and create opportunities which allow infill and further definition of the street edge.
- Update and consolidate patient care facilities.
- Expand clinical practice, ambulatory care, and research/instructional space.
- Complete a 10 year master plan to achieve goals.

In 1989, BUMC conducted a comprehensive planning study of the South End Medical Area including extensive community and City involvement. The Report identified existing conditions, as well as goals and opportunities for the area which are shared by the institutions, City officials and the local community. The University Associates project is consistent with the findings of this report.

The University Associates project is a major component of the South End Medical Area Master Plan. The project has received support from the City and the local community because it is a direct outgrowth of the master plan study and reflects the goals and recommendations of a thoughtful and comprehensive planning process.

1.2.2 EXISTING CONDITIONS

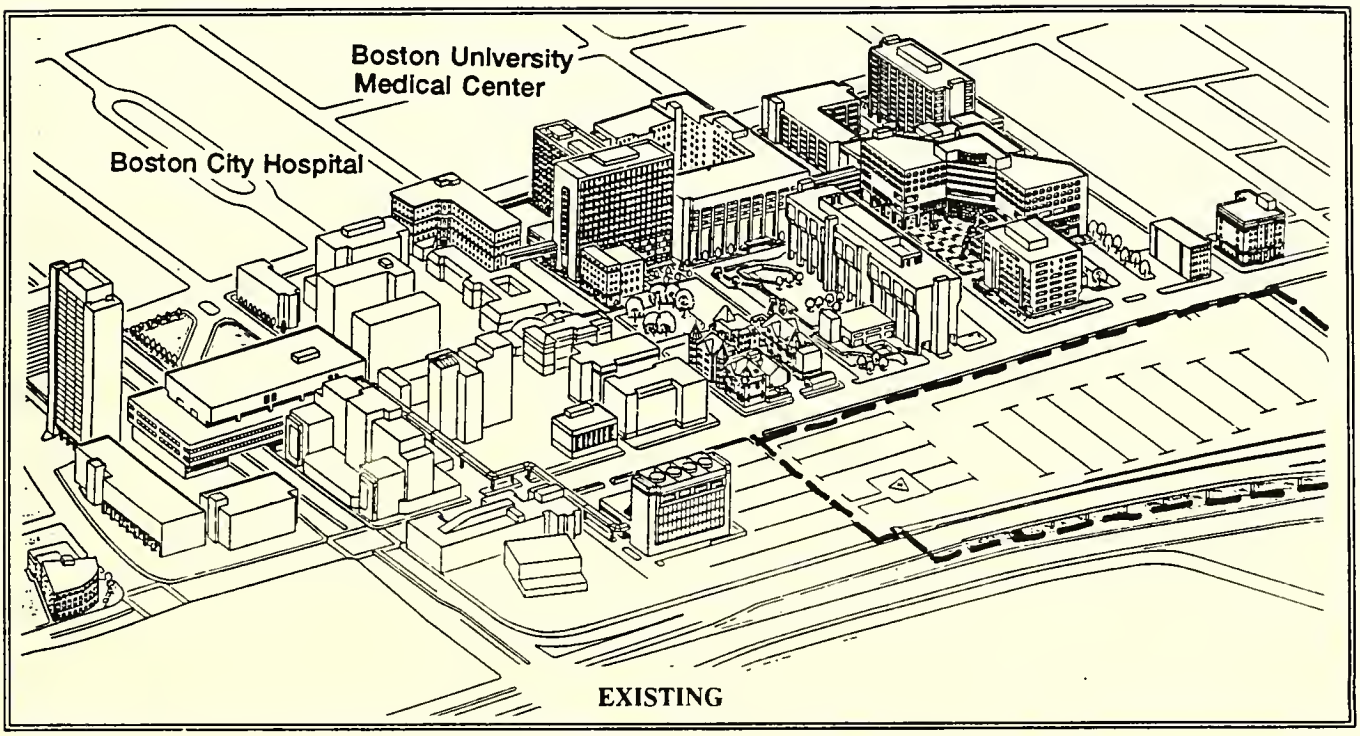
The project site presently is undeveloped and open and is used by Boston City Hospital and Boston University Medical Center for surface parking. It is located at the southern edge of the South End Medical Area between industrial and institutional uses. The front of the site faces on Albany Street and the rear of the parcel abuts the Massachusetts Avenue Connector, a viaduct linking the Southeast Expressway with Massachusetts Avenue. The parcel is bordered on the sides by the Boston City Hospital power plant and wholesale flower distributors. In its current condition, the site is considered an unsightly and unsafe edge along Albany Street. The site is located within the South End Urban Renewal District.

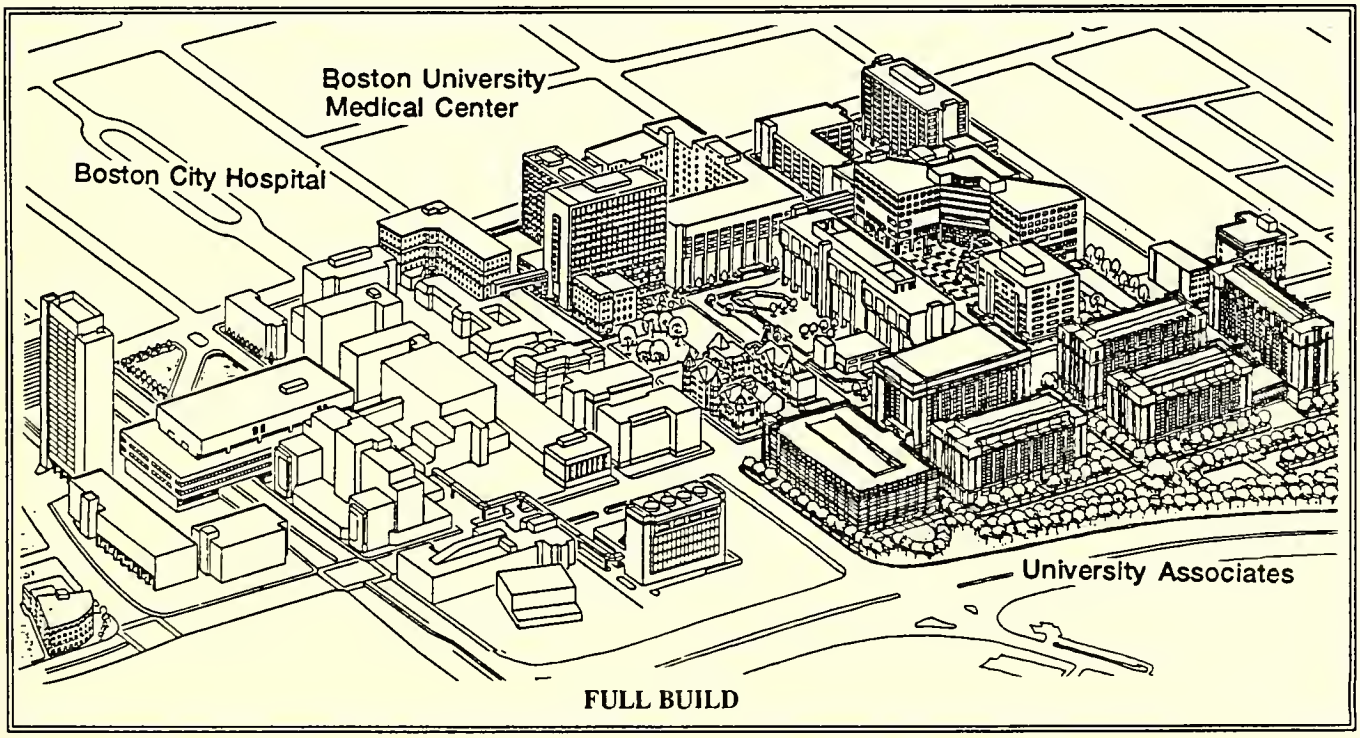


Locus Plan

Prepared By:
Fort Point Associates

Exhibit 1 - 1

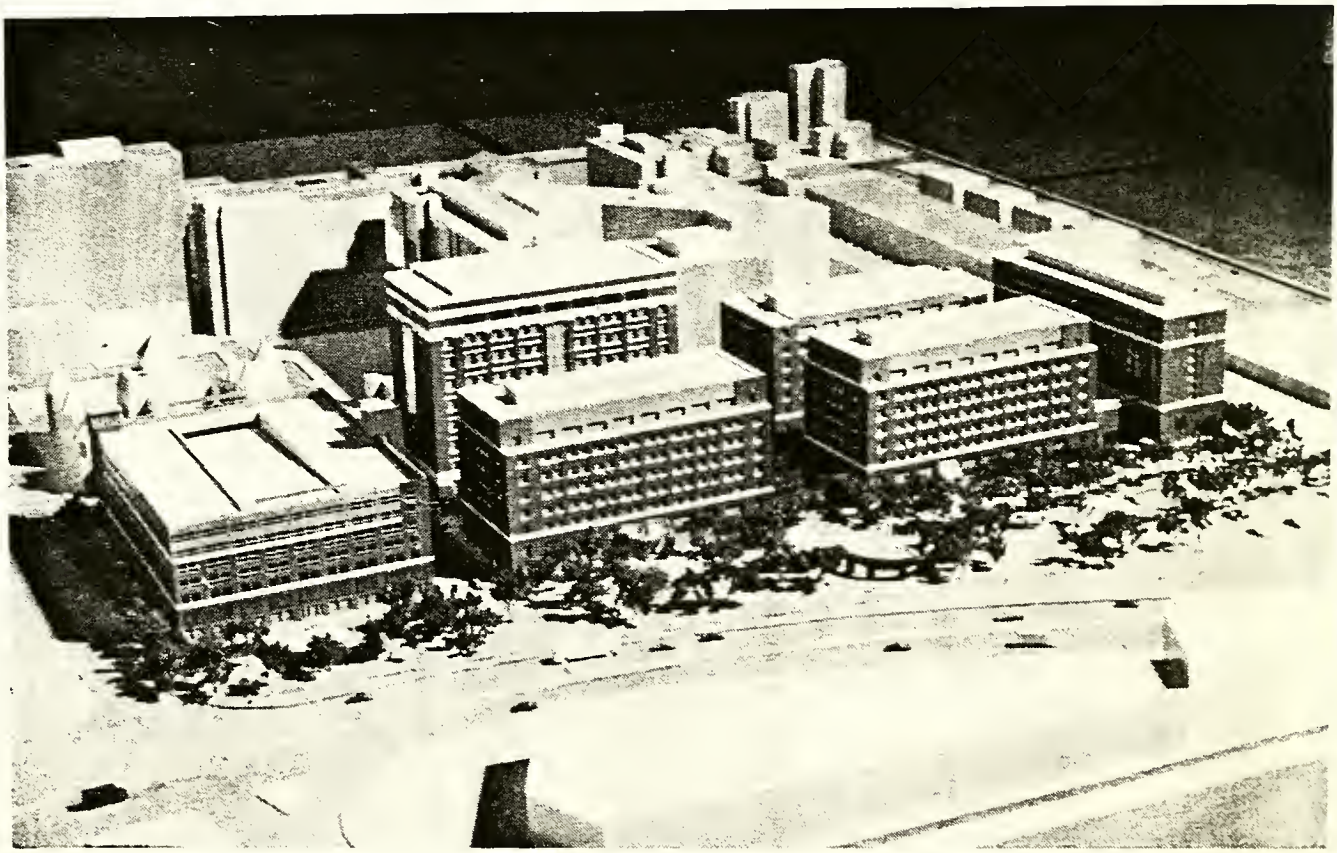




Project Site

Prepared by:
Cambridge Seven Associates, Inc.

Exhibit 1 - 2



Full Build Concept

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 1 - 3

1.2.3 PROJECT PROPOSAL

The University Associates project proposes to develop a total of approximately 1,177,300 square feet of mixed use space on an approximately 8.5 acre site within the South End Medical Area. The project includes five major use elements for the site: approximately 630,000 square feet of medical research/office space, approximately 17,000 square feet of retail space, approximately 12,000 square feet daycare space, a 250 room hotel and a 1,000 space parking garage. It is contemplated that the additional 1,265 parking needed will be provided in a second parking garage adjacent to the site at 600 Albany Street and/or under buildings on site where subsurface conditions are compatible.

The proposed project consists of six structures. The building program includes: 1,000 car parking garage with daycare and retail space on the ground level; one 180,000 s.f. biomedical research building; two 160,000 s.f. medical office/research buildings; one 140,500 s.f. research/office building and a 250 room hotel with a 180 seat restaurant. Phase I of the project, which includes the construction of the parking garage, the 180,000 s.f. medical research building, and a 160,000 s.f. office building would take place from late 1991 through 1994. Construction of Phase II is expected to occur between 1996 and the Year 2000, phased to respond to the growing needs of BUMC. The second garage at 600 Street Albany Street would be built within the Phase II timeframe.

The project also includes extensive landscaping and infrastructure improvements. Among these improvements is the provisions of direct access to the reconstructed Massachusetts Avenue Connector (part of the Central Artery/Tunnel project) through the extension of East Concord Street.

The purpose of the project is to provide a first class medical office and research complex which will serve to replace existing obsolete facilities in the Boston University Medical Campus and The University Hospital complex. It will also support expansion of the growing medical research enterprises of area institutions.

The most dramatic changes resulting from the project will occur along Albany Street. At the present time, the site is used for surface parking. The new buildings will create an attractive urban edge to the existing medical area and act as a buffer between the South End and the Southeast Expressway. Upon completion of the project, Albany Street will be lined with retail shops, landscaped areas, sidewalks with street furniture and will be well lit at night. The proposed project will serve to activate this section of Albany street with new uses which will create an inviting

and safer pedestrian environment, as well as enhance the medical institutions and services in the area.

The proposed facades of the new buildings harmonize with the existing buildings of the South End Medical Area and the historic South End. The exteriors of the buildings include red brick and vertically oriented windows and other architectural elements which harmonize with the characteristic building styles of the South End.

In addition to institutional activities, an 100 child daycare facility will be built to serve the employees of the local medical institutions and the neighborhood. The facility is constructed in the first phase of the project so that it can support existing as well as future demand.

The proposed hotel fills an outstanding need in this area to provide convenient and accessible overnight accommodations for family and friends of patients as well as visitors to the area. It also accommodates individuals from outside the metropolitan area who come for outpatient treatment at the medical complex. The hotel is an amenity to the entire neighborhood as well as to the local medical community.

The parking demand is met by a 1,000 space parking garage in Phase I. Additional demand in Phase II is met through a second garage to be constructed adjacent to the site and possibly structured parking under some of the buildings. The parking planned for the project is designed to meet both existing demand and future needs of the Full-Build development.

Construction of Phase I is slated to begin in the fall of 1991 and be completed by the end of 1994. Phase II construction is estimated to begin in early 1996 and be completed by 2000. The building program is summarized in Table 1-1.

The construction activities are estimated to create 2,600 construction jobs over the life of the project. At the completion of Phase I, the project is estimated to employ 800 persons and, at Full-Build, employment is estimated to be 2,275 persons.

1.2.4 CHANGES IN THE PROJECT SINCE THE DPIR

Since the DPIR was filed, the following changes and improvements have been made in the program. Conditions are now favorable to allow the inclusion of Building 3, the medical office building, in Phase I of the project. As a result of increasing the size of Phase I, employment is anticipated to be almost double the estimate in the DPIR for Phase I. Table 1-1 summarizes the altered building program. The Full-Build program has not changed.

As a result of a series of meetings with the Boston Redevelopment Authority and the Boston Civic Design Commission, the master plan design has been refined to reduce the setback from Albany Street from 20 feet to 15 feet allowing greater internal open space on the site. Surface parking has been removed from the development program affording better open space opportunities. More attention has been paid to the design of the pedestrian bridge incorporating community concerns into the design process.

Additional meetings have been held in the neighborhood and with public agencies. Meetings have been held with the Boston Water and Sewer Commission, Massachusetts Department of Public Works, Central Artery/Tunnel staff, and the Massachusetts Bay Transit Authority. A series of design review meetings with the Boston Civic Design Commission have begun. Meetings with the BRA are on-going and additional meetings with Massachusetts Department of Public Works and the Boston Public Improvement Commission are scheduled. These meetings have served to clarify technical issues associated with the project, but have not resulted in significant project modifications. Meetings with the neighborhood also have been on-going. The cooperative agreement between the proponent and the BRA facilitates continued neighborhood support through the establishment of a Project Advisory Committee (PAC) which will have on-going involvement in the project. Within the PAC are several sub-committees including community benefits, safety, transportation, design and compliance.

Additional environmental analyses have been conducted since the DPIR. Environmental evaluations consisting of subsurface investigations and chemical testing of soil and groundwater samples have been on-going to determine the applicability of MGL Ch. 21E and address areas of the site which may require further evaluation and remediation under the Massachusetts Contingency Plan.

Additional analyses of the Massachusetts Avenue/Melnea Cass Boulevard intersection were conducted, resulting in recommendations that this intersection be included in the City's Critical Intersection Control system to better control congestion. A discussion of traffic patterns after the completion of the Central Artery/Tunnel project also has been added.

Further consideration of air quality, noise, and construction impacts on the proposed daycare center are included throughout the FPIR.

A quantitative wind analysis was conducted for the program reflecting modifications to the project including a significantly more developed landscaping plan. The landscaping plan was modified to respond to potential problems identified through

the qualitative wind analysis. The positive impacts to the landscaping plan are reflected in the results of the quantitative analysis.

Subsequent to the DPIR filing, the proponent has received final designation as developer of the site (October 31, 1991). The BRA approved the Master Plan and Development Impact Project Plan for the University Associates project (September 26, 1991). Additionally, the BRA has approved the Development Plan for both the Parking Garage (Building 1) and the Advanced Biomedical Research Center (Building 2) (September 26, 1991). The Zoning Commission approved a zoning change to a B-4-D district, establishing planned development area (PDA) No. 41 (September 26, 1991). The project also received a Certificate of Approval from the South End Landmarks District Commission (October 1, 1991). Approvals and Agreements are found in Appendix D.

Table 1 - 1
BUILDING PROGRAM

USE	SIZE
Office/Research	629,700 s.f.
Parking Structure	352,000 s.f.
Hotel	166,000 s.f.
Retail	17,300 s.f.
Daycare	12,300 s.f.
Total	1,177,300 s.f.

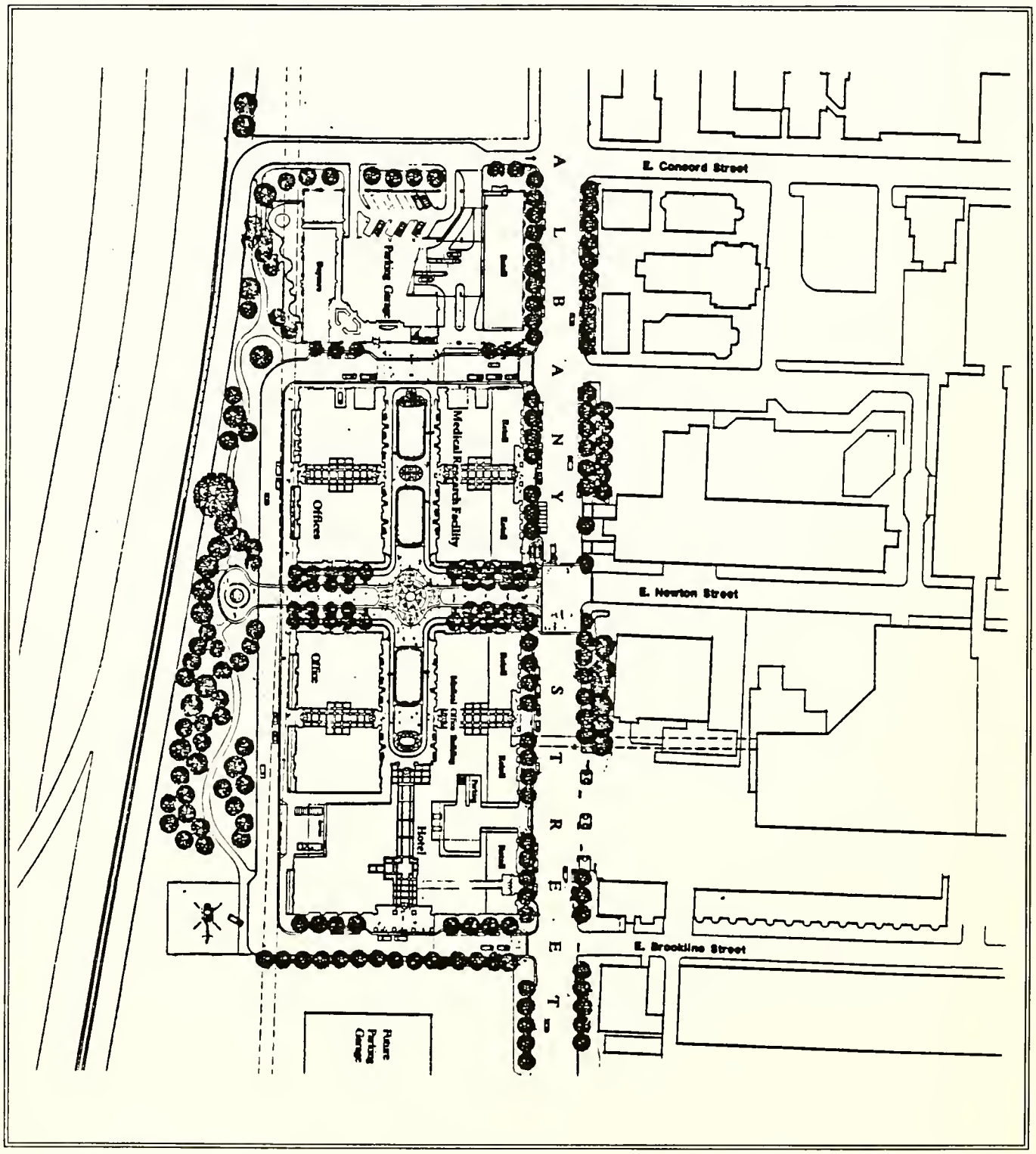
PHASE I

Building 1	1,000	Parking spaces - eight levels
Parking	6,500	s.f. Retail (included)
	12,300	s.f. Daycare
	80	feet high
Building 2	180,000	s.f. Biomedical Research
Biomedical Research	5,400	s.f. Retail (included)
	144	feet high - 9 stories occupiable
	28	feet high mechanical penthouse
Building 3	160,000	s.f. Medical Office
Medical Office	5,400	s.f. Retail (included)
	110	feet high - 8 stories

PHASE II

Building 4	140,500	s.f. Research/Office
Research/Office	110	feet high - 8 stories
Building 5	160,000	s.f. Research/Office
Research/Office	110	feet high - 8 stories
Building 6	166,000	s.f. - 250 Room Hotel
Hotel	180	seat restaurant
	100	feet high - 8 stories

Source: University Associates



Site Plan Full Build

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 1 - 4

1.3 PROJECT DEVELOPMENT TEAM

PROJECT PROPONENT

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Commonwealth of Massachusetts

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WIND

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1.4 CURRENT OR FORMERLY OWNED DEVELOPMENTS IN BOSTON

Boston University Medical Center currently includes approximately 11 acres of land in the South End Medical Area containing 1.6 million s.f. of building space. Major new construction projects over the last two decades include the Evans building at 75 E. Newton Street (167,325 s.f.), the Atrium Pavilion at 88 E. Newton Street (301,030 s.f.), and the Boston University Graduate School of Dentistry at 100 E. Newton Street (99,000 s.f.). University Associates, a limited partnership, was formed to develop the proposed project. (See Exhibit 1- 5, BUMC Property Ownership, and Appendix C, History of BUMC, for additional information.)

1.5 LEGAL ACTIONS PENDING

There are no known legal actions pending which pertain to the proposed project.

1.6 TAX ARREARS

There are no known tax arrears outstanding on the property proposed for development, nor on other properties owned by the proponents.

1.7 EVIDENCE OF SITE CONTROL

In 1967, the Boston Redevelopment Authority (BRA) entered into a cooperation agreement with BUMC as part of the South End Urban Renewal Plan stipulating BUMC needs within the Harrison-East Concord-Albany-East Brookline complex. The plan designated BUMC as a not-for-profit developer for parcels 46 A, B and C. The subsequent disposition of parcels 46A and 46C to University Hospital resulted in the construction of the Evans Building, Atrium Pavilion and the Doctors Office Building.

In 1983, at the request of the Boston University Medical Center, the BRA, by tentative designation, assigned development rights to Parcel 46B, the locus of the proposed project, to University Associates. (See Appendix D.) Subsequent to this designation, the BRA and City of Boston issued a Request for Proposals (RFP) for the disposition of Parcel 46B (July 1991). University Associates submitted a proposal entitled "University Associates Parcel 46B Development Proposal - August 5, 1991". An Interdepartmental task force, composed of representatives of the BRA, the Public Facilities Department and Boston City Hospital, has been assigned to work with the selected developer to effect the disposition of the property, including the creation of an appropriate zoning designation for the area.

On October 25, 1991, the Public Facilities Commission issued the terms and conditions for the conveyance of Parcel 46B. On October 31, 1991, the BRA issued final development and redevelopment designation as developer of the site to University Associates. At that time, the BRA also gave authorization to execute the land disposition agreement. The October 31, 1991 resolution describes a two phase land acquisition process. Phase I includes the approximate 8.5 acres for the development proposed in this FPIR. Phase II acquisition is for approximately 5 additional acres which could be used for future development. Section 2.0, Project Description, and Exhibits 2-5 through 2-7 provide a detailed description of the property involved.

The parcel is composed primarily of land owned by the City of Boston Conduit and the Boston Redevelopment Authority. It is encumbered by the Roxbury Canal which is owned and operated by the Boston Water and Sewer Commission. It is intended that an agreement will be entered into between the developer and the Boston Water and Sewer Commission.

A portion of the development includes land to be designated "as not needed for highway purposes" and to be conveyed from the Commonwealth of Massachusetts to the City of Boston/BRA, for redevelopment consistent with the South End Urban Renewal Plan. There have been discussions with the Massachusetts Department (MDPW) of Public Works and with the Central Artery/Tunnel (CA/T) project to discuss what land would be involved in the transfer and the process through which it would be transferred. The land would be transferred to the City/BRA pursuant to Ch. 762 of the Acts of 1962 as amended by Ch. 567 of the Acts of 1966. Correspondence with MDPW is found in Appendix B of the FPIR.

1.8 AGENCY AND COMMUNITY REVIEW PROCESS

The University Associates project is an outgrowth of the ongoing efforts of Boston University Medical Center to provide high quality services, offer excellent training programs and conduct meaningful medical research. Boston University Medical Center values its neighbors and is sensitive to their concerns and needs.

The planning objectives of the development are consistent with the South End Urban Renewal Plan which was adopted by the City of Boston on December 6, 1965. This plan focuses on the future development of medical/institutional uses in the vicinity of the Southeast Expressway within which the site is located. Additionally, the planning objectives are consistent with the proposed Development Policy Plan for the South End/Lower Roxbury area. This plan establishes the goal of creating employment opportunities for residents within certain specific districts of the South End. One of these districts is designated as a special study area, and references the proposed University Associates project.

Boston University Medical Center initiated a comprehensive master plan of the South End Medical Area which resulted in the 1989 South End Medical Area Planning Study. The process involved the various local neighborhoods, neighboring institutions such as Boston City Hospital, special interests, and a variety of City officials. The area studied ranged from Washington Street on the north to the Southeast Expressway on the south, and approximately from Herald Street on the east to Northhampton Street on the west. The area included the University Associates site in the southern portion of the study area.

This comprehensive effort defined existing conditions in the area, identified concerns and problem areas, and offered recommendations and future goals for land development and other improvements. The University Associates project is consistent with the findings of the study. Furthermore, the project has capitalized on the successful community planning process started through the South End

Medical Area Planning Study and has continued community meetings focusing on the University Associates project.

The University Associates project initiated its own community review process in January 1991. Eighteen community meetings have been held to date (twelve since the DPIR was filed), focusing on various aspects of the project, including traffic, safety, design, community benefits, and general compliance. Attendance at the meetings included representatives from Boston City Hospital, local residents and representatives from the community groups including the South End/Lower Roxbury Ad Hoc Community Development Group, Worcester Square Neighborhood Association, and the Blackstone/Franklin Square Neighborhood Group.

Numerous additional meetings have been held with the South End Landmarks District Commission, Boston Redevelopment Authority, Boston Transportation Department, Public Facilities Department, Boston City Hospital, Boston Civic Design Commission, MBTA, the Boston Water and Sewer Commission, Massachusetts Department of Public Works, and the Central Artery/Tunnel project.

A Certificate of Design Approval was obtained from the South End Landmarks Commission on October 1, 1991. (See Appendix D, Approvals and Agreements.)

Through this process, concerns about traffic, design, height and massing have been resolved. The project has evolved into one which enjoys enthusiastic support. The project is recognized as a major improvement to a blighted area offering attractive buildings, retail and hotel activities along Albany Street, daycare facilities, open space pedestrian improvements, new employment and improved medical research and office facilities.

In addition to direct community input, the following area planning studies and guidelines were consulted in the evolution of the University Associates project.

- South End Medical Area Planning Study, University Hospital, 1989
- South End District Committee Report, Boston Landmarks Commission, 1983
- South End - Lower Roxbury Development Policy Plan, Boston Redevelopment Authority
- Boston City Hospital Master Plan, 1988

- South End Historic Protection District Guidelines
- Boston Zoning Code

The process of meeting with the community to listen to the concerns and to integrate their needs into the project planning will continue throughout the project development.

The BRA approved the Master Plan and Development Impact Project Plan for the University Associates on September 26, 1991. Additionally, the BRA approved the Development Plan for the Center for Advanced Biomedical Research Center (Building 2) and the Technology Square Parking Garage (Building 1). By the above action of the BRA, the Director submitted to the Boston Zoning Commission a request to designate the area as a special purpose overlay district, planned development area no. 41, and requested approval by the Zoning Commission of the development plans for medical research and garage buildings named above.

On November 6, 1991, the Zoning Commission approved the zoning change for the area from an H-3 and M-2 district to a B-4 district and accepted the BRA's recommendation to change the B-4 district to a B-4-D district, thus establishing a planned development area. They also approved the development plans for the garage and medical research buildings. (See Appendix D, Approvals and Agreements.)

The proponent has also been working with the City in developing the Transportation Access Plan and Construction Management Plan for the project.

A School of Public Health Building
B Robinson Building
C Collamore Building
D Old Evans Building
E Evans Building
F Preston Family Building
G Goldman School of Graduate Dentistry
H Health Science Building
K Silvio O. Conte Medical Research Center
L Instructional Building
P Doctors Office Building
Q Atrium Building
R Housman Medical Research Building
T Talbot Building
V Vose Hall
W University Hospital E. Concord St. Warehouse
600 600 Albany Street
615 Naval Blood Research Center

Leased Space
35 35 North Hampton Street Nurses Education Building
801 Gilmore/Vines Building
SCF Dr. Solomon Carter Fuller Mental Health Center

Other
BCH Boston City Hospital (200 Boston University Medical Center physicians and staff support Boston City Hospital)

UNIVERSITY ASSOCIATES

Boston University Medical Center Property Ownership

Exhibit 1 - 5

Prepared by:
Cambridge Seven Associates

NOVEMBER, 1991

1.9 COMMUNITY SERVICES AND BENEFITS

The Boston University Medical Center offers a vast array of services and benefits to the City beyond the direct patient care offered by the member institutions. Below is a selected summary of some of these services and programs. The proposed project serves to continue and strengthen these existing benefits which provide health care and education opportunities as well as direct economic benefits through jobs, taxes and linkage to the City.

Education

- Minority training programs at the School of Medicine including the Early School Selection program, and pre and post doctoral scientific training program.

- Minority recruitment for the Health Care Careers program, a seven week series of science classes for Boston public high school students.

- Training site for Roxbury Community College nursing program.

Research

- Programs which often involve and/or benefit City residents, such as the Police Hypertension program, research on black hypertension, dermatology programs, research on alcoholism, accident prevention and environmental health.

Patient Care

- Over 40% of The University Hospital's outpatients reside in Boston and approximately 36% of inpatients are Boston residents.

- Free health screening including influenza vaccines, skin cancer, prostate cancer, glaucoma, osteoporosis, and dental screening for the elderly in subsidized housing and for Boston public schools.

Home Medical Services

- Direct care and coordination of home health services for approximately 900 frail elderly persons.

- Extension of services to include the Elderly Living At Home program and leasing and assistance for transitional housing to prevent homelessness.

- Extension of health screening services to more on-site housing developments for the elderly.

Occupational Health Programs

- Programs serve mostly Boston-based companies.

- Free employee health screening services at the work site and at The University Hospital.

- Industrial Accident program for businesses, hotels and industries including exposure to radiation and chemical contamination.

- Special support programs for Boston Police and Fire Departments.

Inter-Institutional Cooperation

- Back-up clinical services to Boston City Hospital helping to reduce replication of expensive technology.

- Identification and treatment of malnourished children in Boston City Hospital emergency department.

- Support of the Mayor's Health Line.

- Relationships with neighborhood health centers, Fuller Mental Health Center, Boston City Hospital, and Boston Sickle Cell Center.

Job Training and Outreach

- Leadership role in Project Health Care collaborative teaching and training program for residents of Boston.

- Participation in job fairs, Private Industry Council, and a task force examining the feasibility of a Boston public high school for health careers.

- The University Hospital Affirmative Action Task Force encouraging diversity in the hospital workforce.

Special Services and Programs

- AIDS Teen Program outreach for medical students.
- Payment-in-lieu-of-taxes program.
- Sponsorship of 15 Black Achievers annually.

1.10 SUMMARY OF ENVIRONMENTAL ISSUES AND MITIGATING MEASURES

A combined Draft Environmental Impact Report for MEPA and a Draft Project Impact Report for the BRA was prepared and submitted May 15, 1991. The issues addressed in the report included a detailed analysis of the environmental issues and an analysis of economic impacts, public benefits, geotechnical impacts and urban design issues such as massing, wind and shadow. A Final EIR was submitted to MEPA August 15, 1991 and a final Certificate was received on September 30, 1991.

This Final PIR has been prepared in response to the Preliminary Adequacy Determination on the DPIR issued by the BRA and comments received on the DEIR/DPIR.

The following is a summary of topics and findings addressed in the FPIR.

SHADOW

Impact

The shadow analysis indicates that net new shadows created by the project are not significant and are largely dwarfed by shadows cast from existing buildings. There are some new shadows cast on public areas of Albany Street, residential areas of East Brookline Street and the pedestrian plaza on the project site. Other public areas on or off the site, such as the daycare center play area and the landscaped open space area along the new Massachusetts Avenue Connector are not affected by shadows and retain good solar exposure. Shadow conditions are greatest during the winter when the sun is at its lowest point, but they occur only for short periods of time when few people are out of doors.

Mitigation

The buildings are designed and oriented on the site in such a way as to minimize the creation of new shadows on pedestrian areas and sensitive receptors. Buildings have been shifted on the site to further open the central pedestrian plaza offering additional relief from shadows. Important areas of outdoor public activity, such as the daycare play area, have been sited in areas of consistent solar exposure.

WIND

Impact

A quantitative assessment of the pedestrian level wind environment reveals that wind conditions on the study site generally remain similar to existing conditions with some localized improvements, as well as a few localized areas of higher wind speeds. Generally, improved conditions are experienced at the daycare play area, East Concord Street extension, and also along the East Newton Street extension axis of the pedestrian plaza. Build conditions remain similar to existing conditions along the East Brookline Street extension and the service street which runs along the southern edge of the site, the helipad, and along the on-site open area adjacent to the Massachusetts Avenue Connector. Albany Street generally remains comfortable with some high wind activity which slightly exceeds BRA standards in the winter expected along the Fuller Mental Health Center.

The results of the quantitative analysis show better results than indicated in the initial qualitative analysis. This is due largely to the mitigating effects of the extensively developed landscaping plan for the site.

Mitigation

The project program includes extensive landscaping around the site focusing particularly on areas of potentially high wind conditions. The landscaping plan successfully mitigates potential high wind locations on the site.

HISTORIC RESOURCES

Impact

The University Associates project site is located adjacent to the historic South End Historic District which is designated by the Boston Landmarks Commission and listed in the National Register of Historic Places. It falls within the South End

Harrison Avenue/Albany Street Protection Area. There are no historic structures located on the site or directly affected by the project.

The Massachusetts Historical Commission has issued a finding of no adverse impact of the project (950 CMR 71.07(2)(b)(2)) (Section 13.0, Responses to Comment Letters). The South End Landmarks District Commission issued a Certificate of Design Approval for the project on October 1, 1991. The certificate is in Appendix D, Approvals and Agreements.

Mitigation

The project is designed to be consistent with the scale, massing, and materials of the area's historical industrial and institutional buildings. The project design meets the South End Harrison Avenue/Albany Street Protection Area Guidelines to respect the historic and architectural character of the South End. Furthermore, the project creates a defined southern edge to the South End Medical Area and screens undesirable views of the Southeast Expressway and Suffolk County House of Correction.

TRANSPORTATION

Impact

A full analysis of the issues surrounding transportation including a discussion of assumptions, methodology, traffic impacts and mitigation is included in Section 6.0 of the PIR. The FPIR contains an analysis of the Melnea Cass/Massachusetts Avenue intersection, right-in/right-out only at the East Concord Street Extension/Massachusetts Avenue Connector intersection, and a refined mitigation section. The analysis includes a description of existing conditions and probable impacts in the Year 2000 for both No-Build and Full-Build scenarios. The study area included 12 intersections, six signalized and six unsignalized.

Traffic

It is estimated that at Full-Build, the project will generate approximately 4,706 new vehicle trips. This would include 454 vehicle trips during morning peak hour and 447 vehicle trips during evening peak hour. Service at three of the six signalized intersections will not deteriorate from existing conditions. This is due to a combination of the improvements planned by the City of Boston in coordinating traffic signals operations in the area and the completion of the Central Artery/Tunnel improvements, which will remove cut-through traffic from local streets.

The three remaining signalized intersections deteriorate in the Full-Build year. Two deteriorate without the project due to background growth and other conditions unrelated to the project. The project contributes to the deterioration of only one signalized intersection.

Some of the unsignalized intersections are currently operating at a substandard level of service or will deteriorate by the Year 2000 with or without the project. In the absence of mitigation, these intersections are expected to have a further reduction in the level of service as a result of the project.

An additional analysis of the Massachusetts Avenue/Melnea Cass Boulevard intersection was conducted to identify possible improvements in light of its current and future problems anticipated with or without the proposed project.

Parking

The project will create the demand for a total of 1,265 new parking spaces to serve the needs of the various components of the new development. Of these, 983 spaces are long term spaces, and 282 spaces are for short term use. In addition, parking will be provided to replace spaces currently on the site. The parking demand will be met largely by structured parking. The first parking structure, with 1,000 spaces, will be developed in Phase I of the project. Parking for an additional 1,265 vehicles is being planned in a garage to be located adjacent to the site, at 600 Albany Street, as well as possibly in subsurface parking under buildings where soil conditions are found to be compatible. This will accommodate existing needs and demand created by the project.

Transit/Pedestrian

The project is expected to generate approximately 1,880 transit trips. Of these trips, 272 occur in the morning peak hour inbound and 260 occur in the evening peak hour outbound. An additional 3,824 person trips are expected to be walking trips. The pedestrian trips are largely generated by retail and hotel activities and do not tend to occur during peak times. In general, the mode share is expected to be 60% auto with 40% accommodated by public transit or walking.

Mitigation

A number of measures are proposed to mitigate the impact of the project. As a result of mitigation, all intersections in the project area will operate at comparable or better levels of service with the project in place than currently exist. In addition,

a transportation monitoring program will be implemented in accordance with the Boston Transportation Department requirements.

In addition to the measures outlined below, University Associates encourages the City to add the Massachusetts Avenue/Melnea Cass Boulevard intersection to its Critical Intersection Control system and to maintain the existing loop detectors in this area in an effort to improve traffic flows in this area. The proponent will also support local residents in encouraging the City to implement the Residential Permit Parking Program on residential streets in the area to reduce parking conflicts.

Traffic Control

- Extend East Concord Street to the new Massachusetts Avenue Connector and signalize.
- Signalize intersection at East Concord and Albany Streets.
- Signalize intersection at East Brookline and Albany Streets.

Travel Demand Management

- Formalize the Transportation Management Association.
- Implement ridesharing program through computerization and marketing.
- Establish programs promoting tenant awareness of transportation options including activities such as "Transportation Awareness Day".
- Promote alternative commuting methods by providing preferential parking for carpools and vanpools, encouraging staggered work schedule options, and providing secure bicycle parking.
- Coordinate with CARAVAN for Commuter, Inc. to maximize use of alternative transportation modes.

Public Transportation

- Actively work with the MBTA to provide improved service to the site.
- Conduct a study, with guidance from the MBTA, on the feasibility of new bus routes to better serve the BUMC and BCH medical area.

Parking Management

- Abide by the parking replacement agreement reached with the Public Facilities and Health and Hospital departments to accommodate parking needs during and after construction.

- Improve management of institutional parking supply through the Transportation Management Association for employees, patients and visitors.

- Provide adequate parking for disabled persons in accordance with the Federal Amercians with Disabilties Act (ADA).

Loading and Servicing

- Provide sufficient off-street space to prevent backing or queuing on-street and require all large-scale commercial deliveries to be made at off-street docks.

- Discourage commercial deliveries during commuter peak periods.

- Properly manage loading areas.

Pedestrian Improvements

- Provide pedestrian lighting along Albany Street and throughout the site.

- Provide a pedestrian connector bridge from the project over Albany Street.

- Provide full accessibility to disabled persons.

Monitoring Access Goals

- Implement an approved monitoring program.

AIR QUALITY

Impact

Results of the traffic-related air quality analysis, based on unmitigated traffic conditions at Full-Build, indicate that one and eight hour carbon monoxide concentrations are safely in compliance with the National Ambient Air Quality Standards (NAAQS) which represent acceptable air quality conditions at sensitive receptors. The project does not interfere with the Department of Environmental Protection's goal of attaining and maintaining the NAAQS. The garage is an open air parking structure above the lower levels and is also in full compliance with the NAAQS. Special attention was given to the air quality at the daycare facility in terms of the garage location, potential traffic, and construction impacts. The air quality was found to meet acceptable standards.

Mitigation

Traffic mitigation improvements are designed to reduce traffic congestion and will help to further improve the local air quality conditions. The outdoor play area of the daycare center includes a solid fence with a minimum height of eight feet. There also will be additional temporary fencing during construction to reduce noise and fugitive dust. Other construction mitigation measures include maintaining paving in staging and road areas as much as possible, limiting construction-related travel through the site, and wetting the site where asphalt cannot be maintained. Excavate and dirt stored on-site will be covered and located away from the daycare center and pedestrian areas.

NOISE

Impact

Noise on-site is generated by traffic, external mechanical systems and construction activities. Existing sensitive receptors off-site are not close enough to experience significant impacts from the project except from certain construction activities. No blasting is anticipated for construction of this project. The daycare center will be a sensitive receptor once it is open. The noise levels on-site are kept within acceptable levels as defined in the Regulations for the Control of Noise in the City

of Boston. The ground level noise associated with external mechanical systems does not exceed 55 dBA, which is below acceptable business zone levels.

Mitigation

Precautions are taken to assure noise levels are acceptable from anticipated sources. A permanent high density wall no less than eight feet in height will be placed around the daycare play area reducing traffic noise levels to 60 dBA, which is below acceptable levels in a business zone. External mechanical systems are located on building penthouses removing them from ground level activity. Silencers are included on any air handling intake systems which exceed 55 dBA at ground level. Noise generated from construction activity is mitigated through pre-augering of piles near sensitive receptors and added fencing adjacent to the daycare center. Pile driving will not occur before 8:00AM on weekdays and 9:00AM on Saturdays. Noise control equipment on construction machinery will be inspected to assure maximum effectiveness. Construction activities are scheduled from 7:00AM to 4:00PM and no construction will occur before 9:00AM on Saturdays. Noisy equipment will be located away from the daycare center and pedestrian areas as much as possible.

INFRASTRUCTURE

Impact

The project area is currently served by water and sewer systems under the control of the Boston Water and Sewer Commission (BWSC), with water supply and sewage treatment services being provided to the BWSC by the Massachusetts Water Resources Authority (MWRA). Stormwater runoff is diverted primarily into the BWSC Roxbury Canal conduit.

Domestic Water

The domestic water demand created by the project is approximately 157,620 gallons per day (gpd). It will be supplied by the existing 12" high and low water mains which run along Albany Street.

Sanitary Sewage

The sanitary sewage generated by the project is estimated to be approximately 121,000 gallons per day (gpd). The sewage will be conveyed from the site to the Massachusetts Avenue interceptor via a 30" X 52" sanitary sewer in Albany Street. Construction is currently

underway to separate the existing combined sewer and storm drainage system in Albany Street, and will be completed in 1991.

Storm Water

Storm water runoff from the site will not increase from current levels because the site is already paved and impervious. The project may actually serve to reduce the runoff through the addition of open space and landscaped areas. Storm water flows from the site will be diverted along the southern edge of the property to the Roxbury Canal, a part of the existing BWSC system.

Other Utilities

Other utilities needs, such as electricity, steam, natural gas, telecommunications and data systems will be provided through private utilities.

Mitigation

It is anticipated that the BWSC will be able to meet water demand with the existing supply and distribution system. The project is designed and will be constructed in strict compliance with the Massachusetts Building Code requirements for efficient water use. Condensate from steam will be used to provide make-up water for the cooling towers at peak operations. Venturi flow meters will be installed on fire pumps to alleviate wasted water during monthly tests. Mulch is proposed at all plantings to reduce water evaporation and indigenous plantings have been selected that do not require special water demands.

There is sufficient capacity in the existing sewer system to convey added flows from the project. The measures used to conserve water also serve to minimize sanitary sewage discharge generated from the project. There will be strict adherence to Article IV of the BWSC Sewer Use regulations.

All paved areas will have oil and sand separators to reduce oil and/or suspended solids carried by the storm water into the BWSC storm water system.

SOLID AND HAZARDOUS MATERIALS

Construction

Impact

Preliminary site investigations indicate the possibility of soil and ground water contamination with petroleum products, solvents and PCBs from previous uses on the site. Recent site investigation, since the filing of the Draft PIR, has included 27 test borings with observation wells installed, 14 test pit excavations, 109 soil vapor samples, radar surveys for possible buried tanks and chemical testing of soil and groundwater.

The types and concentrations of the compounds detected are consistent with previous site usage and do not constitute an imminent hazard to human health, safety or welfare or to the environment.

No underground excavation for basements is presently planned for this project. Excavation associated with utilities is expected to be minimal.

Mitigation

All findings from follow-up studies will be filed with the Department of Environmental Protection under the requirements of MGL Ch. 21E. Special planning and proper disposal of contaminated soil will be required if encountered within the limits of excavation. Staging areas and construction roads on site will be paved to control fugitive dust. An Excavated Soil/Material Management Plan (ESMMP) which outlines procedures for on-site classification, handling, testing and guidelines for disposal has been developed for work at the site. The ESMMP can be found in Appendix J. Remediation to prevent exposure or contact with subsurface soils is planned for the children's outdoor play area.

Operations

Impact

The medical research facilities are expected to generate wastes consistent with similar scientific and research facilities. Hotel, daycare and office uses will generate conventional solid and liquid waste streams.

Mitigation

The research buildings will be equipped with special systems which automatically adjust the pH of lab waste water prior to entrance into the sewerage system. Any hazardous materials generated will be handled and disposed of in accordance with local, state and federal requirements. Where appropriate, buildings are planned to have incinerators to handle special laboratory solid wastes which will reduce the volumes of waste transported from the site.

Tenants within the project are responsible for disclosure of potentially hazardous wastes from specific laboratory operations and for obtaining all related permits, approvals, and monitoring and reporting. The cooperative agreement between the proponent and the BRA provides for the establishment of a Project Advisory Committee which will continue to work cooperatively with BUMC in reviewing and monitoring environmental safety plans including the handling of hazardous materials and medical lab operations.

GEOTECHNICAL

Impact

The preliminary site investigation indicates that the project buildings will need to be supported on end-bearing piles in the glacial till or rock. It is anticipated that pile lengths will range from 120 to 145 feet. Since construction of the buildings involves only minor excavation, there will be no influence on the ground water. Construction generally will not require dewatering and is not expected to significantly affect the ground water levels at the site.

There are no structures located immediately adjacent to the area which would be affected by settlement, vibration, noise or any other construction condition. The only utility which is in close proximity to the development site is the Roxbury Canal Conduit.

Mitigation

Precautions such as test pilings, pre-augering piles in sensitive areas and use of monitoring equipment will be implemented to avoid any adverse impact due to pile driving or other construction activities on the structural condition of the Roxbury Canal during construction. No other mitigation measures are expected to be necessary.

CONSTRUCTION

Impact

The project is planned to be constructed in two phases commencing with Phase I in late 1991, with Phase II commencing in 1996 to be completed by the Year 2000.

The construction of the project is expected to create an average daily workforce of 75 persons. Approximately 38 peak hour vehicle trips are expected to be generated, with the remaining workers utilizing public transportation.

Staging of construction equipment and materials will be handled on the project site. Parking will be accommodated on-site and on nearby property controlled by University Associates.

Construction work hours are scheduled from 7:00AM to 4:00PM. Construction related deliveries occur by an approved delivery route utilizing the Southeast Expressway, Massachusetts Avenue Connector and Albany Street.

Air quality impacts during construction are expected to be minor. It is anticipated that the number of vehicles and operating machinery at any one time will be less than eight. Fugitive dust will be minimal due to the site being paved. Trucks and stockpiled debris will be covered as needed. Vibration and noise associated with pile driving are not expected to be significant outside the site limits. Blasting is not necessary.

Mitigation

Precautions will be taken to protect public safety through covered walkways and additional fencing of the site near the daycare center. Pile cavities will be pre-augered near utilities and other sensitive receptors on-site. There will be coordination with other construction projects and City improvements planned in the area. Submission and implementation of a Construction Management Plan which fully addresses on-site staging for machinery and materials, designated truck routes, truck waiting areas.

Construction management features:

- Exclusion of vehicles from East Brookline, East Concord, and East Newton Streets. Traffic on-site will be limited, particularly near pedestrian areas and the daycare center.

- Encouragement of construction workers to use public transportation.
- Coordination of construction sequencing with MDPW's reconstruction of the Central Artery and with BTD for other construction projects in the area.
- Provision of police officer traffic management.
- Provision of covered pedestrian walkways.
- Wetting of exposed areas to reduce fugitive dust.
- Restrictive pile driving and weekend construction hours will be implemented.
- Debris stockpiled or on trucks will be covered. Dumpsters will be emptied regularly.

Prior to construction, an Integrated Pest Management Plan will be established to control the rodent population disrupted by construction.

Similar construction mitigation measures have been established for the CA/T construction activities near the site.

1.11 REGULATORY CONTROLS AND PERMITS

The Environmental Notification Form for the University Associates project was filed March 15, 1988 and a Certificate on the ENF issued April 27, 1988. A Notice of Project Change was submitted to MEPA February 15, 1991 and a Determination was issued March 27, 1991. A Project Notification Form was filed with the BRA November 16, 1991 and a Scoping Determination for the project was issued May 29, 1991. A combined Draft EIR/PIR was filed with MEPA and the Boston Redevelopment Authority May 15, 1991. A Certificate accepting the Draft EIR was issued June 28, 1991. An Adequacy Determination on the DPIR was issued October 18, 1991.

The federal, state and local approvals which are anticipated for this development include the following:

FEDERAL

Federal Highway Administration	Alteration of Interstate Highway
Nuclear Regulatory Commission	Amend existing BUMC Materials License

STATE

Executive Office of Environmental Affairs, MEPA Unit	Certificate of Compliance
Department of Environmental Protection (DEP)	Massachusetts Contingency Plan Approvals and Permits Fossil Fuel Utilization Permit Limited Plan Approval EPA Hazardous Waste Generator Number Cross Connection Permit
Massachusetts Water Resources Authority/DEP	Sewer Connection Permit Industrial User Permit
Mass. Historical Commission	Determination of No Adverse Impact
Mass. Department of Public Works	Highway Access Permit
Mass. Department of Public Works/ Central Artery/Harbor Tunnel	Land Disposition Approval Alteration of a State Highway

MUNICIPAL

Boston Redevelopment Authority	Article 31 Review
Boston Zoning Commission Boston Board of Appeals	Planned Development Area Approval Zoning Code Exceptions
BRA/Public Facilities Department	Developer Designation (RFP Parcel 46B) Land Disposition Approval Approval of Parking Agreement (BCH)

Boston Fire Department	Fire Apparatus Access Approval Permit for Removal/Installation of Underground Fuel Tanks
Inspectional Services Department	Building Permit Certificate of Occupancy
Committee on Licenses	Inflammable Storage Permit
Boston Water and Sewer Commission	Sewer Connection Permit Water Connection Permit Site Plan Approval
Boston Air Pollution Control Commission	Parking Approval
Boston Transportation Department	Transportation Access Plan Construction Management Plan
South End Landmarks District Commission	Certificate of Design Approval
Department of Public Works	Curb Cut Permit Street Opening Permit
Public Improvements Commission	Improvements to Public Way
Boston Civic Design	Design Review Commission

1.12 BRA ADEQUACY DETERMINATION ON THE DRAFT PIR

BOSTON
REDEVELOPMENT
AUTHORITY

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October 18, 1991

Mr. Robert Walsh
Walsh Associates
307 West First Street
Boston, MA 02127

Re: University Associates Project

This letter is the Preliminary Adequacy Determination (the "Determination") of the Boston Redevelopment Authority (the "BRA") with respect to the Draft Project Impact Report (the "DPIR") for the proposed University Associates Project (the "Proposed Project"), submitted to the BRA on June 20, 1991.

The BRA is issuing this Determination pursuant to Section 31-5 of the Boston Zoning Code (the "Code"). This Determination requests information required by the BRA for its review pursuant to Article 31 of the Code.

PREAMBLE

The BRA is reviewing the Project pursuant to multiple sections of the Code. The Proposed Project is being reviewed pursuant to Article 31 of the Code, Development Review Requirements, which sets out a comprehensive procedure for project review, and requires the issuance of a Final Adequacy Determination prior to issuance of a building permit. The Final Adequacy Determination is issued upon determination by the BRA that the Final Project Impact Report (the "FPIR") is satisfactory.

In addition, the Proponent has requested that the project site be designated a Planned Development Area ("PDA"), rather than an Urban Renewal Area ("U") Subdistrict, as initially requested, and has proposed a Master Plan for the development of the PDA. To be granted such a designation, the BRA must approve a Master Plan and Development Plan after a public hearing and petition the Boston Zoning Commission to designate the site as a PDA, pursuant to Article 3-1A of the Code.

The Proposed Project also requires Development Impact Project ("DIP") Plan approval, pursuant to Article 26A of the Code. Prior

o receiving zoning relief, the Proponent must meet the DI: equirements, pursuant to Sections 26A-3 and 26B-3 of the Cod. hese requirements include that the BRA approve the DIP Plan aft: public hearing, and that the Proponent enter into a DIP Agreement ith the BRA.

he Proposed Project may also require exceptions under Article 6A of the Code for the following deviations from the code:

- Floor Area Ratio
- Off-street loading
- Off-street parking
- Uses

Conditions for approval of exceptions are outlined in Section 6A-3 of the Code.

Finally, the Proposed Project is located within the South End Urban Renewal Project Area. Consequently, approval of the Proposed Project may require that the BRA amend pertinent provisions of the South End Urban Renewal Plan. In addition, the Proposed Project will require a Land Disposition Agreement between the BRA, the City of Boston, and the Proponent regarding the sale and conveyance of Parcel 46B.

Because the review requirements discussed above address related, but not identical, issues, the BRA is incorporating its review of zoning relief for the Proposed Project into the Article 31 process to eliminate regulatory duplication and to consolidate the Proposed Project's review into one process and one set of documents.

PROJECT REVIEW

But for the required corrections, clarifications, and additional information referenced in the attached Technical Appendix, the DPIR submitted is sufficient to satisfy the scoping requirements.

We look forward to reviewing the Final Project Impact Report.

Sincerely,

Gerard Kavanaugh
Director of Institutional Planning

TECHNICAL APPENDIX
TO THE
PRELIMINARY ADEQUACY DETERMINATION
FOR
UNIVERSITY ASSOCIATES PROJECT

A. DEVELOPMENT REVIEW REQUIREMENTS - ARTICLE 31

Article 31 of the Code institutes a process by which large-scale development projects will be reviewed by the BRA. In its review of the DPIR, the BRA has identified certain components which are insufficient and which the Proponent must modify, and additional information which the BRA requires in order to issue a Final Adequacy Determination. The following is a description of the sufficiency of the materials submitted in the DPIR, and the additional materials which the Proponent must include in the FPIR.

1. PROJECT SUMMARY

The DPIR states in the Project Summary that the Proposed Project will be located on an approximately 16 acre site. In other sections of the document, however, the project site is listed as approximately 7.5 acres. This discrepancy should be clarified. A description of metes and bounds or a certified survey of the project area should be included in this section as well as in the Project Description Section (See number 2 below).

The Project Development Team does not list a landscape architect. If there is one for the Proposed Project, that individual or firm should be identified.

The discussion on site control of the project site states that the majority of land is owned by the City of Boston and the BRA, and that a portion of the site will be acquired from the Commonwealth of Massachusetts after the completion of the Central Artery/Third Harbor Tunnel ("CA/THT") project. A map identifying property ownership as well as a detailed accounting of property ownership should be included in this section or the Project Description Section. In addition, all encumbrances and ownership issues related to the project site should be described in the FPIR, including the nature of the agreements necessary to secure these encumbered parcels.

The Proponent has requested an MPDA and PDA designation for the project site, rather than a "U" Subdistrict designation as initially requested in the DPIR. Existing zoning requirements, and any anticipated requests for zoning relief under an MPDA and PDA designation should be explained in the FPIR.

2. PROJECT DESCRIPTION

The Site Plan (Exhibit 4), Site Boundaries (Exhibit 10), and Parcel Plan (Exhibit 11) all show different boundaries, creating confusion as to what is the actual site being developed. A description of metes and bounds or a certified survey of the project site should be included in this section. The correct site should then be identified and reflected in all exhibits in the FPIR.

The DPIR estimates that the Proposed Project will provide more than $4 million in annual real estate taxes following its completion. If agreements are to be executed regarding the phased acquisition of parcels, the nature of these agreements and their impacts on estimated property taxes should be described in the FPIR.

The Proposed Project includes the placement of a child care center within the garage structure, with an outdoor play area between the garage and the Massachusetts Avenue Connector. This appears to be an inappropriate location for a child care center. The only perceived benefit of the proposed location is that the play area would receive the maximum amount of sun during the day. Peak hour traffic passing the outdoor play area is estimated at 2,000 to 2,100 vehicles. Issues of air quality, noise, and safety are of obvious concern. An analysis of air quality and noise (from traffic, the proposed garage, and future construction phases) as well as safety must be included in the FPIR. Mitigation measures must also be presented, including measures relating to the existence (and demolition) of the overhead ramp which directly abuts the child care play area and which will remain in place until the final stages of construction of the CA/THT (see numbers 7 and 8 below).

The DPIR states that the child care center will be available to employees. No information is provided on whether slots will be available for non-employee community residents. The number of slots and the criteria for determining eligibility for community residents, if proposed, should be identified. Information regarding financial assistance or subsidies to employees or non-employee community residents, if proposed, also should be presented in the FPIR.

The discussion of the Proposed Project's phasing is incomplete. A tentative development and construction phasing schedule for all structures which comprise the Proposed Project, including the phasing of all infrastructure improvements, public and private open space, and parking and site access, must be presented in the FPIR. Phase I should include a substantial portion of the proposed infrastructure improvements and open space initiatives for the entire Master Plan, and these improvements should be described (see number 13 below). In addition, a discussion of the impacts of the CA/THT on the construction and phasing of the Proposed Project, including the phasing of all parking and site access needs, must be presented in the FPIR (see number 6 below).

The DPIR estimates the total project cost at $200 million. The Proponent should present costs for the individual components of Phases I and II in the FPIR.

Corrections:

- Page 2-5 (last paragraph) should read "Exhibits 6-9."
- Page 2-10 (last paragraph) should read "Table 3."
- The writing on Exhibit 15 is not possible to read.
- On page 2-38, reference to Exhibits 21-28 should read "28-35."
- The titles on Exhibits 34 and 35 should be reversed.

3. SHADOW

Because of the orientation of the buildings, the pedestrian plazas will be in shadow for most of the year, with the least impact occurring at midday during the summer season. Mitigation measures addressed in the master planning and design review process would seem appropriate to mitigate this impact (see number 13 below). Buildings located across Albany Street from the site will be affected only in the morning hours, and the rear of the residences along East Brookline Street will be shaded by the proposed hotel in the winter mornings.

4. HISTORIC RESOURCES

The Proposed Project is located in the South End Harrison/Albany Protection Area, and is therefore subject to review by the South End Landmark District Commission. Prior to the issuance of a building permit, a certificate of design approval must be issued by the South End Landmark District Commission.

The height of the proposed Research Building (144 feet, plus 24 foot mechanical penthouse) most comply with the standards for the Protection Area. Additions or penthouses be allowed if they are not visible from the nearest public way within the Landmark District.

The FPIR must restate and document the assertion that the Proposed Project will have no impacts on archaeological resources.

5. WIND

A quantitative wind analysis was required by the Scoping Determination. Only a qualitative analysis was presented. A quantitative (hot-wire) wind tunnel analysis must be included in the FPIR.

The qualitative analysis did indicate that there are potentially several areas where unacceptable wind conditions would occur as a result of the Proposed Project, and in some cases the BRA threshold could be exceeded. Particularly windy areas are identified along Albany Street, along the service lane, and within the proposed pedestrian plaza, which would be particularly affected by the northwest (winter) winds. These excessive winds, together with the shadow impacts identified above, would tend to make the pedestrian plaza an unpleasant and uncomfortable place for pedestrian activities. Also, building corners will be particularly subject to accelerated winds. Design (massing) modifications may be necessary to reduce the wind impact. Other mitigation measures that should be considered in the FPIR include building setbacks, canopies, and extensive landscaping (see number 13 below).

Exhibits 54 - 71 should show the larger study area to include the buildings which would influence wind conditions on the site.

Corrections:

- The statement on the BRA wind criterion (paragraph one, page 5-6) should be restated to say that the effective gust velocity should not exceed 31 mph.

- On page 5-6 (end of third paragraph) reference to Exhibit 61 should be Exhibit 56.

6. TRANSPORTATION COMPONENT

The Boston Transportation Department ("BTD") is currently drafting a Transportation Access Plan ("TAP") Agreement for execution between the City of Boston and the Proponent. A TAP Agreement must be finalized prior to the formal submission to the BRA of Design Development documents.

Table 14 shows modal splits for work and non-work trips for the different land uses. Sources given are previous studies. Most of the factors appear reasonable, with the possible exception of non-work trips for the hotel and research facilities, where the walk percentages are 35 and 50 percent respectively. The source studies should be presented in the supporting documentation.

The Project-Generated Parking Demand Table in Appendix F does not provide the restaurant generation rate, which should be included

with all other uses.

There is no analysis of the impact of project-generated trips on the capacity of the existing (or future) public transportation facilities. This analysis must be provided in the FPIR.

There is no analysis of future pedestrian circulation impacts, including a level of service ("LOS") analysis. This analysis must be provided in the FPIR.

The mitigation discussion indicates that even with the proposed mitigation measures, the Massachusetts Avenue/Melnea Cass Boulevard intersection will operate at an unacceptable LOS-F in the evening peak hour. Further mitigation measures should be investigated.

The DPIR documents that in five intersections, the LOS in either the a.m. or p.m. will be degraded between the No-Build and Build conditions. These findings indicate the need for an aggressive mitigation program in the TAP Agreement.

Exhibit 90 shows one proposed loading dock to be located off Albany Street (between the hotel and medical office building). The mitigation section indicates that there will be no impact on the local street system due to truck backing or queuing. However, trucks would have to back into this Albany street loading dock, thereby affecting local street traffic. This conflict needs to be resolved. Among the analysis of mitigation measures, alternative locations for this loading dock should be investigated in the FPIR.

On page 2-32, the DPIR states that there will be direct access to the proposed garage from both Albany Street and the Massachusetts Avenue Connector via the extension of East Concord Street. However, Exhibit 91 and the text on page 6-69 indicate that the East Concord Street extension will be a one-way street exiting onto Albany Street. The Albany Street entrance will therefore not be accessible via the East Concord Street extension. Access routes to the garage should be clarified in the FPIR.

No analysis is provided regarding the changes in parking supply and demand during the project timetable. Specifically, the supply should be identified for each development phase, and a discussion should take place on how each individual phase affects the overall total supply versus the expected demand. The planned acquisition or construction of additional parking sites should also be included. Reference is made in several places to a second garage, but no location or schedule is described. This should be clarified. A discussion of timing should be presented as well, particularly the timing of development of Phase II within the context of the construction of the CA/THT. This discussion should include an analysis of impacts of changes in the expected schedule of construction of the CA/THT. Maintenance of adequate parking during all phases of construction must be guaranteed. The FPIR

must describe and illustrate how this will be accomplished.

The impacts on the entire Boston University Medical Center ("BUMC") complex resulting from parking that will be displaced during phased development and following full build should be discussed in the FPIR. Necessary agreements between Boston City Hospital ("BCH") and the Proponent regarding parking should also be explained.

The discussion of existing off-street parking should include information about employee, patient, visitor, or resident use. Future parking conditions should include a discussion about how and where short-term patient and visitor parking will be accommodated during development phases and following full build. The amount of short-term public parking available in the proposed garage should also be presented in the FPIR.

The parking analysis indicates that there will be a small surplus of parking spaces in the year 2000. This analysis is unclear as to whether it accounts for any possible future needs of BCH or BUMC. The source for the 250 space reduction in demand by BCH must be provided in the FPIR.

Surface parking for 90 spaces is included in the site plan. The Scoping Determination states that "(s)urface parking should not be permitted on the project site." The Proponent has committed to provide all parking on the project site in structured parking facilities at full build. This commitment must be reflected in the site and parcel plans in the FPIR (see number 13 below).

In Table 18, the assumption is made that all Turnpike traffic will take the Southeast Expressway. While this is theoretically true now, in the future it is expected that the left turn from Massachusetts Avenue onto the Turnpike will be made legal and be given an exclusive lane. As a result, it would be more attractive for Turnpike users in the p.m. to access the Turnpike via Massachusetts Avenue west. This potential change should be noted in the FPIR.

On page 6-49, the DPIR states that the LOS at the Berkeley/Albany intersection will improve due to the CA/THT project. It is not clear that this assumption is correct, particularly since the plans for the Broadway Bridge are now being reconsidered. This uncertainty should be noted in the FPIR.

In figures 74, 75, and 85-88, there is a discontinuity in the link between the Malden/Albany and East Brookline/Albany intersections. This should be explained.

Corrections:

- Page 6-5 (first sentence) begins with an incomplete sentence.

- On page 6-14 (last sentence) the reference to Table 7 should be Table 9.

- Page 6-16 (first sentence) should be corrected to note that only 3 unsignalized intersections (not 4) operate at LOS D.

- It should be noted that the Orange Line does not pass through the study area if the study area is defined as Exhibit 72.

- Exhibit 78 should be corrected to show that Bus Route 1 goes to Dudley Square.

7. AIR QUALITY

If the outdoor play area of the child care center is to be located, as proposed, at the corner of the Massachusetts Avenue Connector and East Concord Street, an air quality analysis is required to be performed at this location as well (from traffic, the proposed garage, and future construction phases), since the play area will be a sensitive receptor. This analysis, along with mitigation measures, must be included in the FPIR.

Corrections:

- CAL3QHV (1st line, last paragraph, page 7-4) should be CAL3QHC.

8. NOISE

The discussion of noise is minimal and does not comply with the Scoping Determination. A detailed discussion of noise impacts is required for the FPIR.

The DPIR does not evaluate the effect of noise levels on the child care center's outdoor play area, either during the construction of Phase II, during demolition of the Massachusetts Avenue Connector, or following full build. If the child care center play area is to be located within the proposed site, an analysis of noise impacts, along with mitigation measures, must be included in the FPIR.

9. INFRASTRUCTURE

The Technical Appendix (Appendix H) contains calculations of utility demand loads, and they are summarized in Table 32 of the DPIR. No totals, however, are provided in Table 32, making it difficult to analyze the discussion. The FPIR should include total figures for utility demand loads in Table 32.

The DPIR does not provide an analysis of the adequacy and capacity of the infrastructure systems to serve the site (only BWSC hydrant data is supplied). In order to analyze the impacts of projected utility demand loads, information on the capacity of the systems expected to support these loads must be provided. Documentation of contact with the utilities and a description of the utilities' ability to provide necessary levels of service must be presented in the FPIR.

In Table 31, the high service flow rates are lower than those of low service, although the available flow of water is greater. Given the doubled pressure in the high service line, this merits an explanation.

The discussion of sanitary sewer (page 9-3) indicates that sanitary sewerage would be connected to a 66" x 68" brick sewer within Albany Street. Exhibit 104 shows that the sewage lines from the project connect to a 30" x 52" combined sewer line. This discrepancy must be clarified. Any additional catchbasins connecting to the Albany Street 30" x 52" sewer for storm drainage should be indicated. All existing (to be removed or retained) and proposed utility connections should be shown.

Exhibit 104 appears to indicate that telephone services (fibre optics, conventional service, duct system crossing Albany Street) are all in the same service line. The accuracy of this exhibit should be clarified. The direction of utility origin, if applicable, should be indicated on this exhibit as well.

Discussion of potential recycling or conservation measures should be presented in the FPIR, such as seasonal cooling tower blowdown reuse or recycling of steam condensate.

Special precautions must be taken to avoid any damage, from vibration or movement, to the sewage and drain structures passing through the site. Such precautions are implied in the Geotechnical Impact Section, but should be referenced and defined in the Infrastructure Section as well.

10. SOLID AND HAZARDOUS WASTE

The DPIR concludes that existing site contamination (petroleum products, solvents, PCBs) do not constitute an imminent hazard to human health, safety or welfare. The presence of PCBs could be extremely hazardous. More detailed information, including past and current site investigation reports, should be provided in the FPIR. Evaluation of the potential hazards and impacts on the child care center play area is particularly critical, and should be specifically addressed as well.

The air quality impacts of on-site incineration of biological (and other) wastes should be evaluated by the user and the data submitted to the authority in accordance with the cooperation

agreement. The impacts of special wastes generated by the research facilities should be evaluated as well.

The Scoping Determination required a description of proposals for recycling and reduction of waste generation. A description of such proposals must be included in the FPIR.

11. GEOTECHNICAL IMPACTS

The information presented in the DPIR represents an acceptable study of geotechnical impacts on the project site.

12. CONSTRUCTION IMPACTS

Wetting of the site to minimize fugitive dust as well as other standard dust suppression measures is recommended and should be included in the FPIR.

Sedimentation tanks/basins should be provided for the removal of sediment from groundwater and runoff prior to discharge into the Roxbury Canal Conduit. This matter should be addressed in the FPIR.

Pre-auguring for selected piles is recommended to reduce off-site noise, since pile driving produces extremely high noise levels and the Proposed Project is adjacent to hospital facilities and residences. This matter should be addressed in the FPIR.

No discussion is presented on construction impacts as they relate to (and are affected by) the construction of the CA/THT. These impacts and coordination with the CA/THT, along with mitigation measures, must be addressed during the master planning process.

The FPIR must provide information regarding the frequency of application of poison-baiting for rodent control measures.

13. URBAN DESIGN

The FPIR must include an Urban Design component as required by the Scoping Determination. In addition to the planning and design drawings submitted in Chapter 2.0, Project Description, the Urban Design component of the FPIR must include the following items:

1. Master plan options that address the problems of wind, shadow, narrow dimensions, and conflicts with service and parking access in the areas intended to be public open space; specifically the options shall illustrate streets, squares, and pedestrian ways that create a sense of

"campus" for the Proposed Project, that relate to the South End pattern of neighborhood squares in size and orientation, and that are not compromised by adjacency to service functions; these options shall be presented in site plans and site sections drawn at the scale of 1" = 40'.

2. Phasing plans showing the proposed buildings, infrastructure (streets, alleys, and pedestrian ways), and surface parking spaces at the end of each phase of project development; the Phase One plan showing buildings A and B shall include a similar proportion of the total proposed public open space and infrastructure; the phasing plans shall be presented in drawings at the scale of 1" = 40'.

3. A final build-out plan that shows no surface parking at the completion of the Proposed Project.

4. An elevation drawing of Albany Street at a scale of 1" = 20' or larger showing that all buildings have primary facades and main entrances facing Albany Street.

5. Eye-level perspective views showing what terminates the vistas looking south along the centerlines of East Concord, East Newton, and East Brookline Streets.

B. AGREEMENTS

In addition to completing the Development Review Requirements process, the agreements and plans listed below must be provided in form and content satisfactory to the appropriate signatory public agencies before building permits may be issued for the Project:

A) Master Plan and Development Plan pursuant to Section 3-1A of the Code;

B) Development Impact Project (DIP) Plan pursuant to Article 26A of the Code;

C) Development Impact Project (DIP) Agreement, including provisions for Jobs Contribution Grant and Housing Contribution Grant, pursuant to Articles 26A and 26B of the Code;

D) Land Disposition Agreement;

E) Cooperation Agreement pursuant to Section 31-14 of the Code;

F) Transportation Access Plan (TAP) Agreement;

G) Traffic Maintenance Plan in conformity with the City's Construction Management Program;

H) Boston Residents Construction Employment Plan, pursuant to Chapter 12 of the Ordinances of 1986 of the City of Boston, as amended by Chapter 17 of said Ordinances, and Executive Order Extending Boston Residents Job Policy, signed by the Mayor on July 12, 1985; and

I) First Source Agreement with the Mayor's Office of Jobs and Community Services.

2.0 PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

The University Associates project involves the development of an approximately 8.5 acre site in Boston's South End Medical Area. The project facilitates the upgrade, replacement and consolidation of existing Boston University Medical Center research and parking facilities. It also includes a hotel and future expansion of medical and office space. The site is currently used as surface parking for Medical Area employees and visitors. The project will revitalize Albany Street with mixed use activities as well as provide an attractive buffer, screening the South End from the Massachusetts Avenue Connector and the Suffolk County House of Correction.

2.2 SITE HISTORY

Until the 1850s, the site was part of the South Bay and consisted of mudflats and marsh. In the 1850s, it was partially filled by the City of Boston, the Front Street Corporation and other individual property owners. Also around this time, the Roxbury Canal was constructed along the southern edge of the site. The remainder of the site was filled in the early 1900s.

Since the mid-1800s, a series of public facilities have occupied the site. A portion of the site hosted a series of two-story brick and wood buildings used by the U.S. Army and State Militia as barracks and stables. In the late 1800s, the buildings were transferred to the City of Boston and used for a variety of public works activities, including stable and wagon storage, cleaning and sanitary activities. At this time other portions of the site were occupied by Boston Water and Sewer Services and used for machine shops, storage, plumbing and meter repairs and parking garage. In the early to mid-1900s, a number of buildings were razed. The remaining buildings were in a variety of uses such as paint and carpentry shops, motor equipment storage and repair, vehicle repair and municipal garage.

The site was included in the City's South End Urban Renewal District in the 1960s. All structures on the site were razed prior to 1983. Since then, the site has remained undeveloped and used for surface parking. Additional history is discussed in Section 4.0, Historic Resources.

2.3 SURROUNDING AREA

The project site is located in the South End of Boston at the southern edge of the South End Medical Area. This part of the South End contains a mix of institutional, industrial, and residential land uses. The area also includes vacant or unbuilt land which is associated either with an institutional use or surface parking.

Medical institutional uses are predominantly north of the site. Beyond Harrison Avenue are residential areas and more institutional uses. To the east along Albany Street, toward the Massachusetts Turnpike Extension, are a variety of light industrial uses and surface parking.

On the other side of the Massachusetts Avenue Connector lies the new Suffolk County House of Correction and the Newmarket Square industrial area. The correctional facility can be seen from BUMC even though it is on the other side of the Southeast Expressway. Along Albany Street to the west are warehouse, industrial and institutional uses, with the Roxbury community beyond Massachusetts Avenue.

2.3.1 IMPROVEMENTS IN THE AREA

Boston City Hospital is currently undergoing a major reconstruction. The project involves two phases of construction which will provide a new facility, demolition of existing facilities, and major site improvements. The project began late in 1990 and is expected to take 42 months to complete.

The Suffolk County House of Correction has been recently completed. The Central Artery/Tunnel (CA/T) project is underway and will be ongoing through most of the 1990s. As part of the project, sometime in the mid-1990s, the Massachusetts Avenue Connector will be rebuilt at-grade behind the site.

The Boston Water and Sewer Commission continues to conduct infrastructure improvements in the vicinity of the site, in particular, sanitary sewer improvements. The Albany Street interceptor and combined sewer separation along Albany Street between Massachusetts Avenue and Herald Street is close to completion. See Table 2-1, Improvements In Project Area.

Table 2 - 1
IMPROVEMENTS IN PROJECT AREA

AGENCY	PROJECT	AREA AFFECTED	ESTIMATED SCHEDULE
Boston Water & Sewer	Sewer Separation	Albany St. Side Streets between Washington & Harrison from Mass. Ave. to Herald St.	Present to 1991
Boston Water & Sewer	Albany St. Interceptor	Albany Street	1/89-1/90
Mass. Dept. of Public Works	Broadway Bridge	Frontage Rd. Expressway Ramps Albany St.	11/88-7/89
Mass. Dept. of Public Works	West 4th St. Bridge	Frontage Rds. Expressway Ramps Albany Street	7/89 to mid 1991
Mass. Dept. of Public Works	Third Harbor Tunnel	Study Area	1989 - 1994
Mass. Dept. of Public Works	Central Artery Depression	Study Area	Start Construction 1992 Northbound Opens 1995 Southbound Opens 1996
Mass. Dept. of Public Works	Mass. Ave. Connector	Albany St. Malden St. Union Park/Wareham E. Concord St. Mass. Ave. Frontage Rds. Melnea Cass Blvd.	Start Construction 1993

Source: South End Medical Area Plan Study 1989

Table 2 - 1 (Continued)
IMPROVEMENTS IN PROJECT AREA

AGENCY	PROJECT	AREA AFFECTED	ESTIMATED SCHEDULE
Boston City Hospital	In-patient Facility	Mass. Ave. Albany Street Harrison Ave. E. Concord St. Melnea Cass Blvd.	Start 1991
Mass. Div. of Capital Planning and Operations	House of Correction	Frontage Rds. Southampton St. Mass Ave Connector Mass. Ave. Melnea Cass Blvd.	Completed in 1991

Source: South End Medical Area Plan Study 1989

2.4 EXISTING CONDITIONS

The development site consists of a parcel of land containing approximately 372,593 s.f., or approximately 8.5 acres, located at 624 - 710 Albany Street across from The University Hospital and Boston University Medical Center. The site is bounded by Albany Street to the north, Massachusetts Avenue Connector to the south, the Boston City Hospital power plant to the west and the Flower Exchange to the east.

The site is mostly paved and used as surface parking for BUMC and Boston City Hospital complexes. The site is relatively flat, varying only a few feet in elevation from 11 feet to 14 feet above Mean Sea Level. The City has given the site an urban renewal designation by including it in the South End Urban Renewal District. The site has recently been rezoned to B-4-D and established as PDA no. 41.

The main access to the site is from Albany Street. Albany Street is an unattractive four-lane city street which lacks cohesion. Views to and from the site toward the South End are blocked by elevated pedestrian bridges along East Concord Street and East Newton Street.

Abutting the South End of Boston, the site is adjacent to the South End Landmark District and falls within the South End Harrison Avenue/Albany Street Protection area. The property is currently owned by the City of Boston, Boston

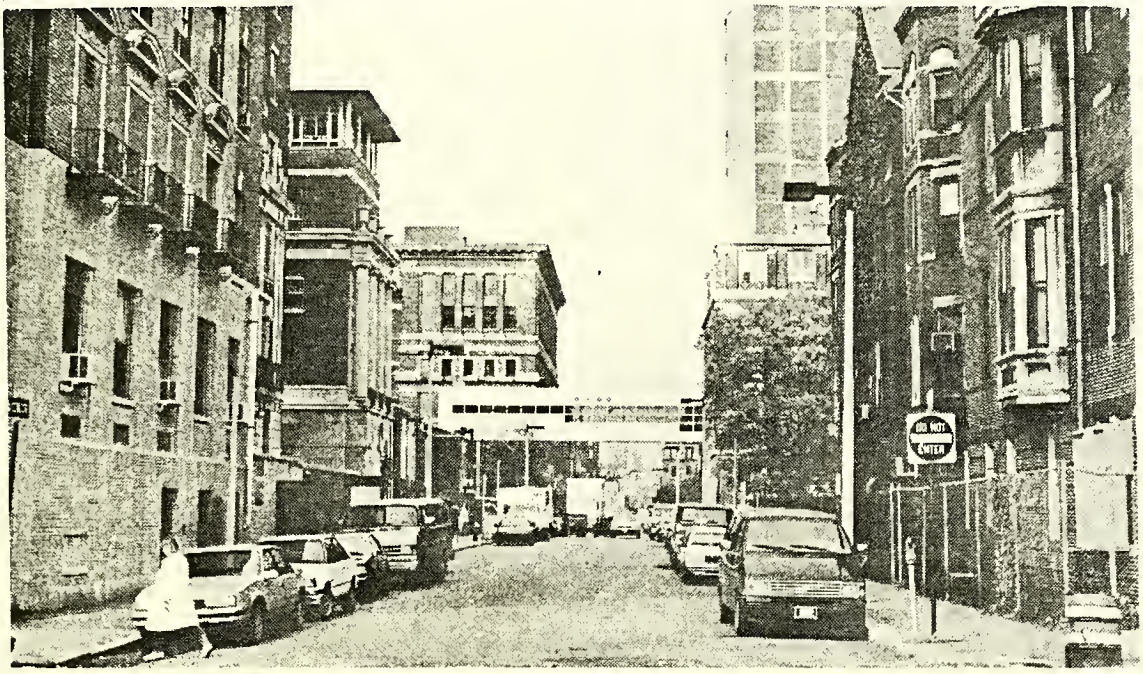
Redevelopment Authority and the Commonwealth of Massachusetts. The BRA has authorized developer and redeveloper designation to University Associates and the execution of a land disposition agreement. There are easements owned by the Boston Water and Sewer Commission associated with the Roxbury Canal Conduit along the southern edge of the site.

Exhibits 2-1 through 2-4 provide views of the site from adjacent areas and from the site along major corridors.

East Newton Street Looking South

Prepared by:
Cambridge Seven Associates, Inc.

Exhibit 2 - 1



AT ALBANY STREET

AT HARRISON AVENUE

Views on East Concord Street

Prepared by:
Cambridge Seven Associates, Inc.

Exhibit 2 - 2

Views of Site from South

Prepared by:
Cambridge Seven Associates, Inc.

Exhibit 2 - 3

LOOKING EAST

LOOKING WEST

Views of Site Along Albany Street

Prepared by
Cambridge Seven Associates, Inc.

Exhibit 2 - 4

2.5 PROJECT OBJECTIVES

Objectives for the University Associates project were established through a process which combines the needs of the proponent and other medical institutions in the area, neighborhood interests, and other local plans and guidelines. The objectives identified through this project are summarized below, not in order of importance:

- Upgrade and consolidate medical facilities and provide opportunities for new quality medical services, office and hotel which enhance the medical institutions' campuses.

- Create a strong edge and terminus to the South End neighborhood while creating an appropriate edge to the city.

- Create a place which strengthens the identity of the medical area and provides direction for retrofitting the existing medical campus through new streetscape paving, planting, lighting, signage, building materials and detail.

- Create a plan which provides positive impacts on adjacent uses.

- Create an environment which builds upon, and is compatible with, the existing street and building fabric.

- Create a system of pedestrian paths and open spaces which are active, inviting and safe day and night.

- Create a more efficient parking and transportation system to serve the medical institutions and area.

2.6 PROJECT DESCRIPTION

This section presents a detailed description of the building program, phasing of the development, circulation patterns and design elements. The project is composed of six buildings totalling approximately 1,177,300 s.f. The project proposes four major use elements for the site: medical research/office with approximately 629,700 s.f.; parking with approximately 352,000 s.f.; a hotel with approximately 166,000 s.f.; retail space of approximately 17,300 s.f.; and approximately 12,300 s.f. of daycare space.

The development site includes approximately 8.5 acres represented by parcels A - F. See Exhibit 2-8. Exhibit 2-9 illustrates the site plan at Full-Build. The site coverage

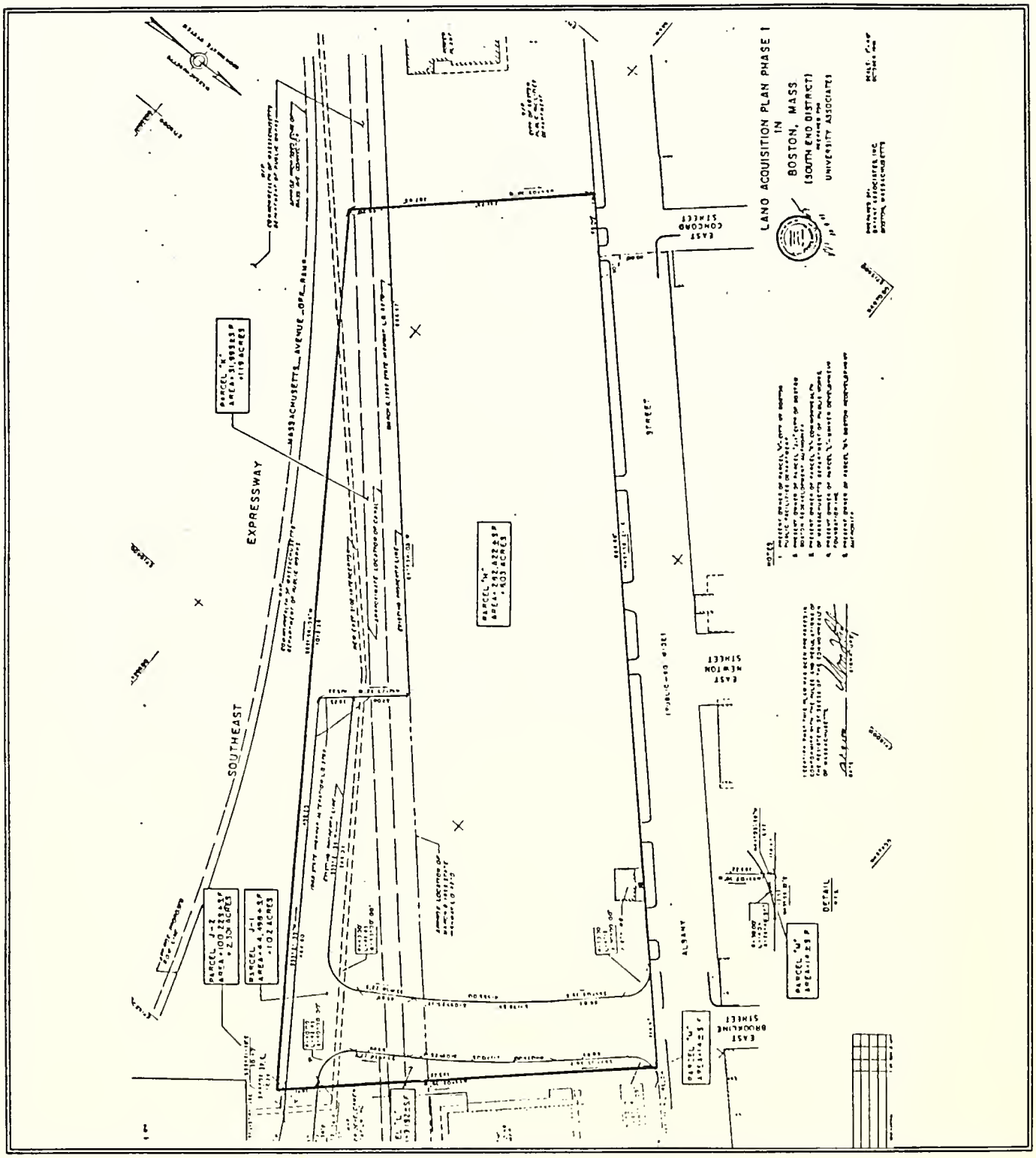
will be approximately 37%. The total project reflects an overall Floor Area Ratio (FAR) of 3.2 on the development site. Table 2-2 summarizes the parcel data.

On October 31, 1991 the BRA passed a resolution regarding developer designation which also authorized the execution of a land disposition agreement. The agreement describes a two phase acquisition process. Phase 1 involves the approximately 8.5 acres required for the University Associates project described in this document. It includes parcels H, K, and J-1, L and M as shown in Exhibit 2-5. Phase 2 of the acquisition involves approximately 5 additional acres for future development which include parcels J-2 and Q as shown in Exhibits 2-6 and 2-7.

Parcels K and Q are owned by the Commonwealth of Massachusetts. It is contemplated that these parcels will be conveyed to the City pursuant to Ch. 762 of the Acts of 1962 as amended by Ch. 567 of the Acts of 1966.

The proposed project will serve to improve safety and revitilize the area through the activities associated with the buildings, building design, new pedestrian opportunities, daycare services, improved parking and circulation. Pedestrian activity along Albany Street will be encouraged and stimulated through the location of a mix of retail uses in each building on Albany Street and the location of office and hotel entrances.

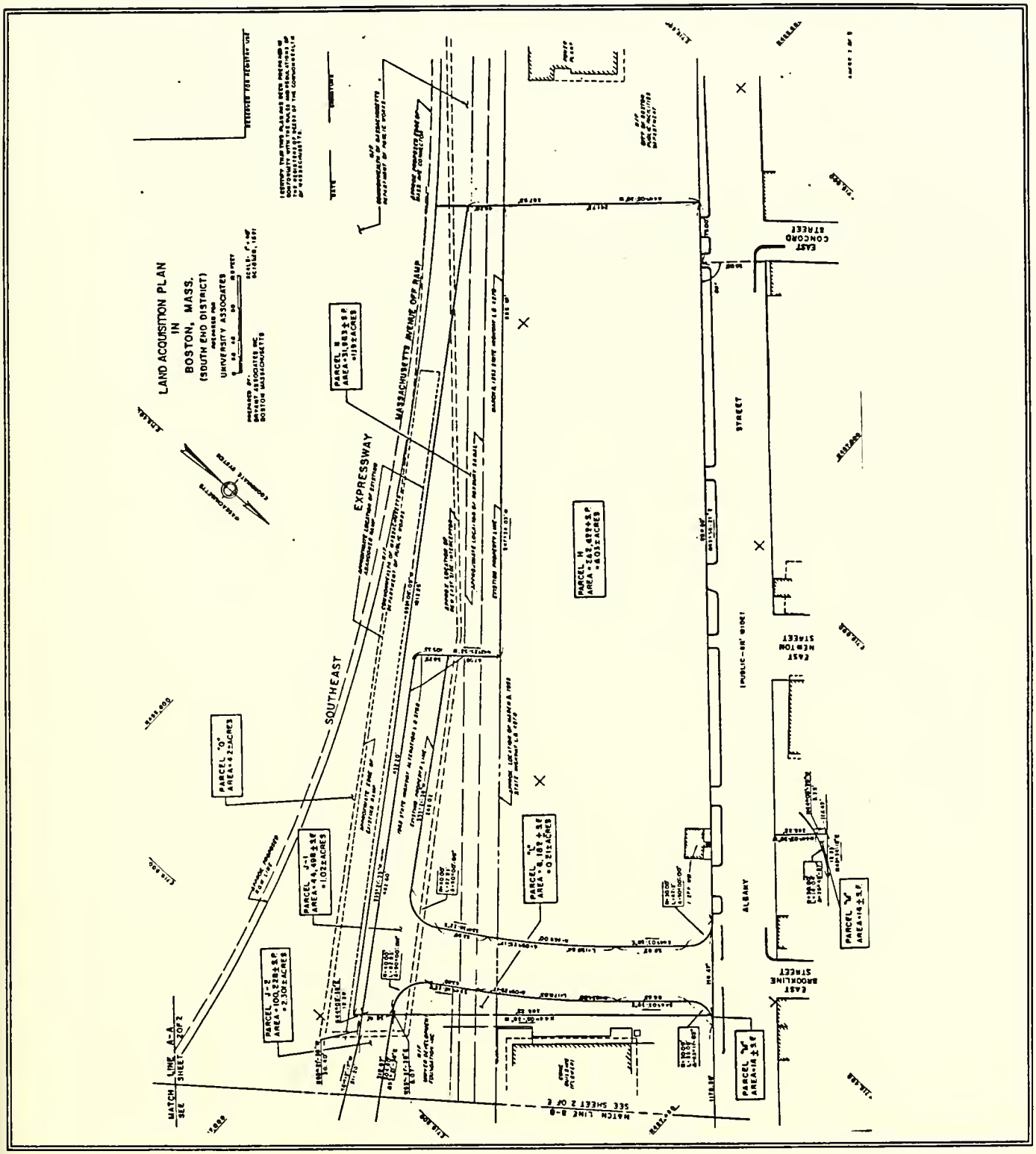
The site plan capitalizes on the opportunity of providing a gateway to the South End from the new Massachusetts Avenue Connector. The alignment of the pedestrian plaza with the existing South End street pattern ensures that open space and plazas are knit into the existing urban South End fabric through the extension of East Newton Street. A new access point to the site and to the new Massachusetts Avenue Connector will be provided through the extension of East Concord Street. Additional access will also be created through the extension of East Brookline Street.



Phase 1 Land Acquisition

Prepared By:
Bryant Associates, Inc.

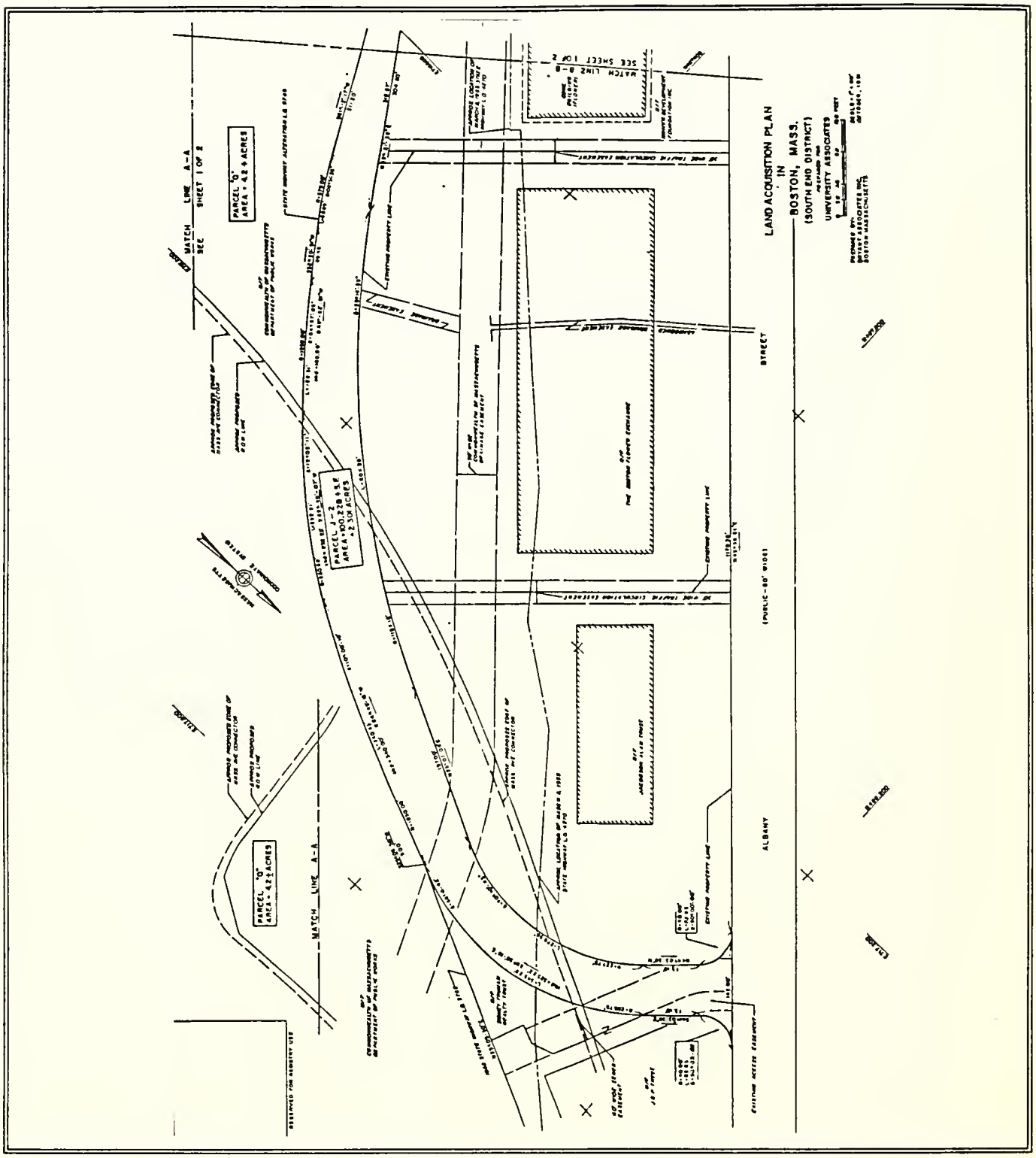
Exhibit 2 - 5



Phase 2 Land Acquisition

Prepared By:
Bryant Associates, Inc.

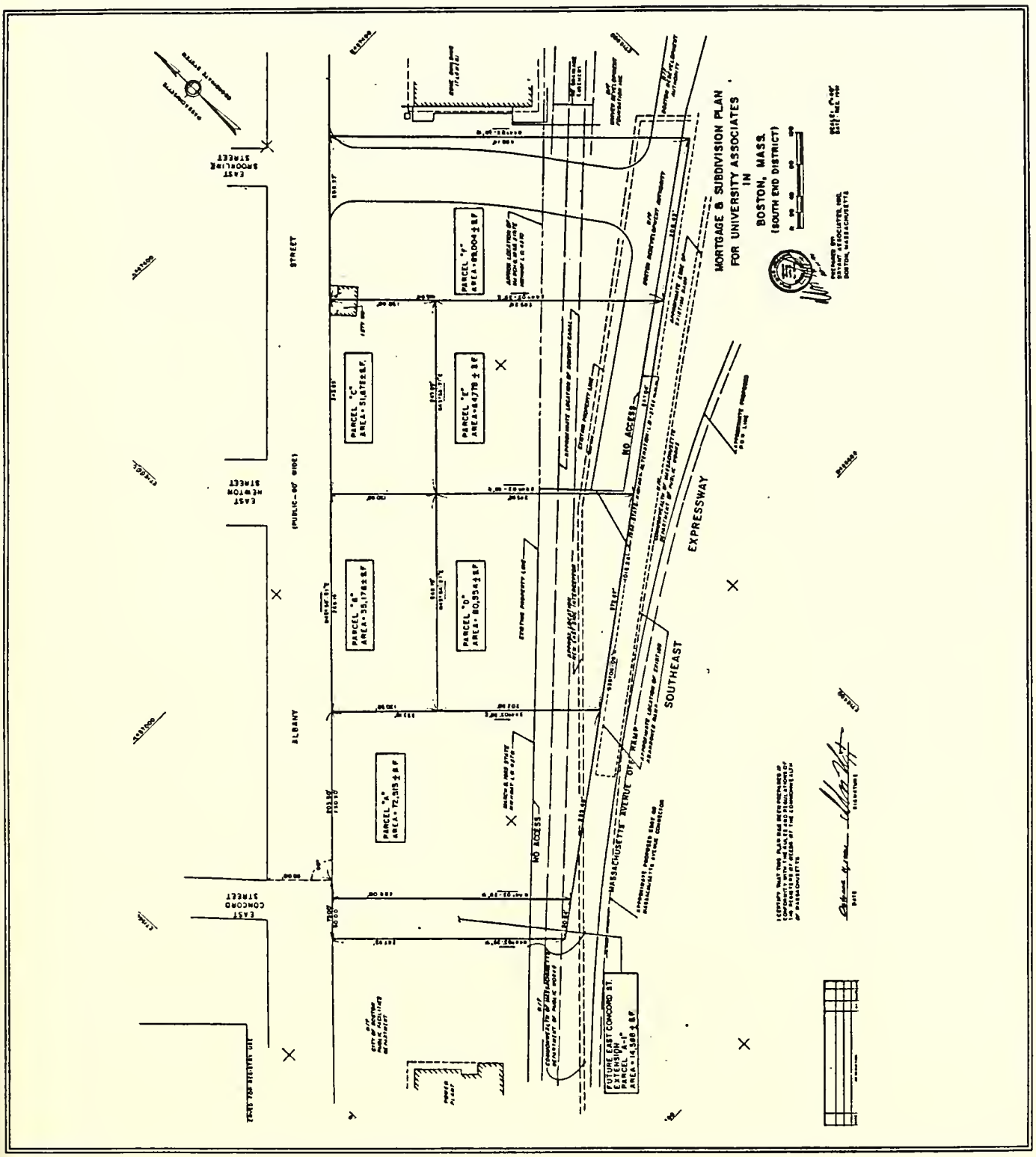
Exhibit 2 - 6



Phase 2 Land Acquisition (Continued)

Prepared By:
Bryant Associates, Inc.

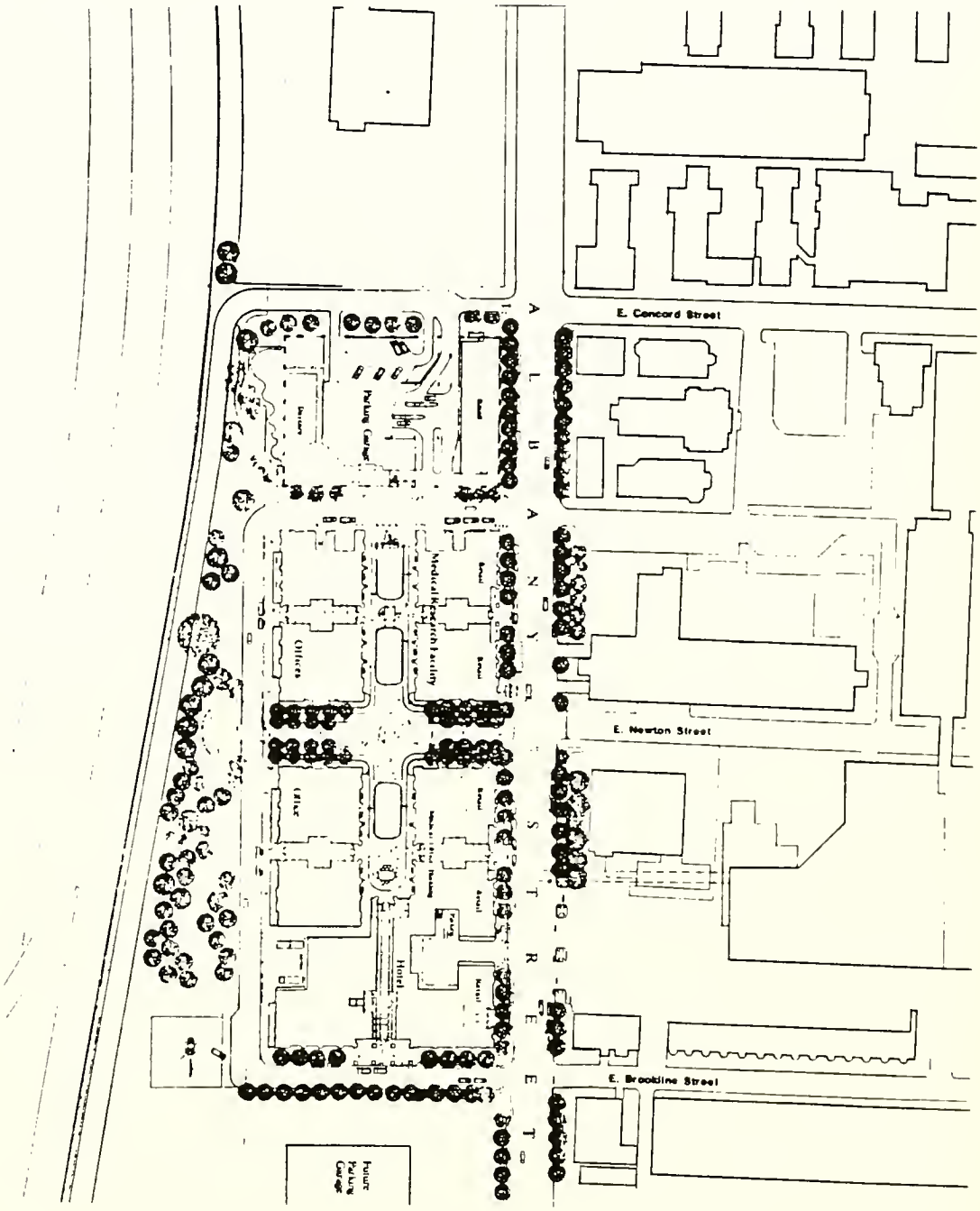
Exhibit 2 - 7



Parcel Plan

Prepared By:
Bryant Associates, Inc.

Exhibit 2 - 8



Full Build Site Plan

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 2 - 9

Table 2 - 2
PARCEL DATA

Parcel A	91,411 s.f.	**Parcel B**	35,178 s.f.
Building 1	370,800 s.f.	Building 2	180,000 s.f.
FAR	4.0	FAR	5.1
Footprint	44,000 s.f.	Footprint	20,000 s.f.
Lot Coverage	48%	Lot Coverage	57%
Parcel C	31,872 s.f.	**Parcel D**	60,354 s.f.
Building 3	160,000 s.f.	Building 4	140,500 s.f.
FAR	5.0	FAR	2.4
Footprint	20,000 s.f.	Footprint	20,000 s.f.
Lot Coverage	63%	Lot Coverage	33%
Parcel E	64,775 s.f.	**Parcel F**	89,000 s.f.
Building 5	160,000 s.f.	Building 6	166,000 s.f.
FAR	2.5	FAR	1.9
Footprint	20,000 s.f.	Footprint	15,000 s.f.
Lot Coverage	31%	Lot Coverage	17%

SUMMARY DATA

Development Site	372,593 s.f. (8.5 acres)
Total Buildings	1,177,300 s.f.
FAR	3.2
Total Footprint	139,000 s.f.
Lot Coverage	37%

Source: Fort Point Associates

2.6.1 DETAILED PROGRAM DESCRIPTION

Building Program

PHASE I

Phase I of the University Associates project includes three buildings, extension of East Concord Street to access the garage, and a service drive to the buildings and garage. Materials and design elements have been selected to be compatible with the historic institutional/industrial character of the area. Massing of the buildings is in keeping with other older buildings in the area and employs similar techniques to deal with horizontal and vertical elements. The buildings within the project are similar in style so as to offer unity, rhythm, and pedestrian level activity throughout the complex, but particularly along Albany Street. A Phase I site plan is shown on Exhibit 2-10.

Building 1, located on Parcel A, is a 1,000 car garage with approximately 6,500 s.f. of retail space and approximately 12,300 s.f. for daycare on the first level. The building, which totals approximately 370,800 s.f. with a 44,000 s.f. footprint, will be approximately 80 feet in height. The garage consists of seven levels of parking in an open air structure. Garage entrances are accessed from an extension of East Concord Street and are segregated from the pedestrian activities along Albany Street.

The building employs brick and glazing in a manner which is sympathetic to the historic district and other buildings in the project area along Albany Street. The design pays special attention to safety concerns at entrances and internal circulation.

The retail activity is focused along Albany Street in order to serve the project as well as the medical complex and neighborhood.

The daycare center is located in this building on the side away from the Albany Street traffic. This location allows for a large secure outdoor play area, as well as the opportunity to connect to the park along the Massachusetts Avenue Connector. The design segregates parking garage traffic from daycare center pick-up and drop-off activities and from pedestrian activity along Albany Street. Exhibits 2-11 through 2-13 provide elevations and layout of Building 1.

Building 2, located on Parcel B, consists of a 180,000 s.f. biomedical research building which includes 5,400 s.f. of retail space. It has a 20,000 s.f. footprint and

is 144 feet high with a 28 foot high mechanical penthouse. The building has main entrances on Albany Street and facing the pedestrian plaza.

The retail activities in the building are located on the ground floor along Albany Street. The retail use, building and streetscaping design elements are aligned in Buildings 1, 2 and 3, and are repeated throughout the other buildings in the project, particularly along Albany Street. Servicing and loading access are located on site along the service drive on the west side of the building.

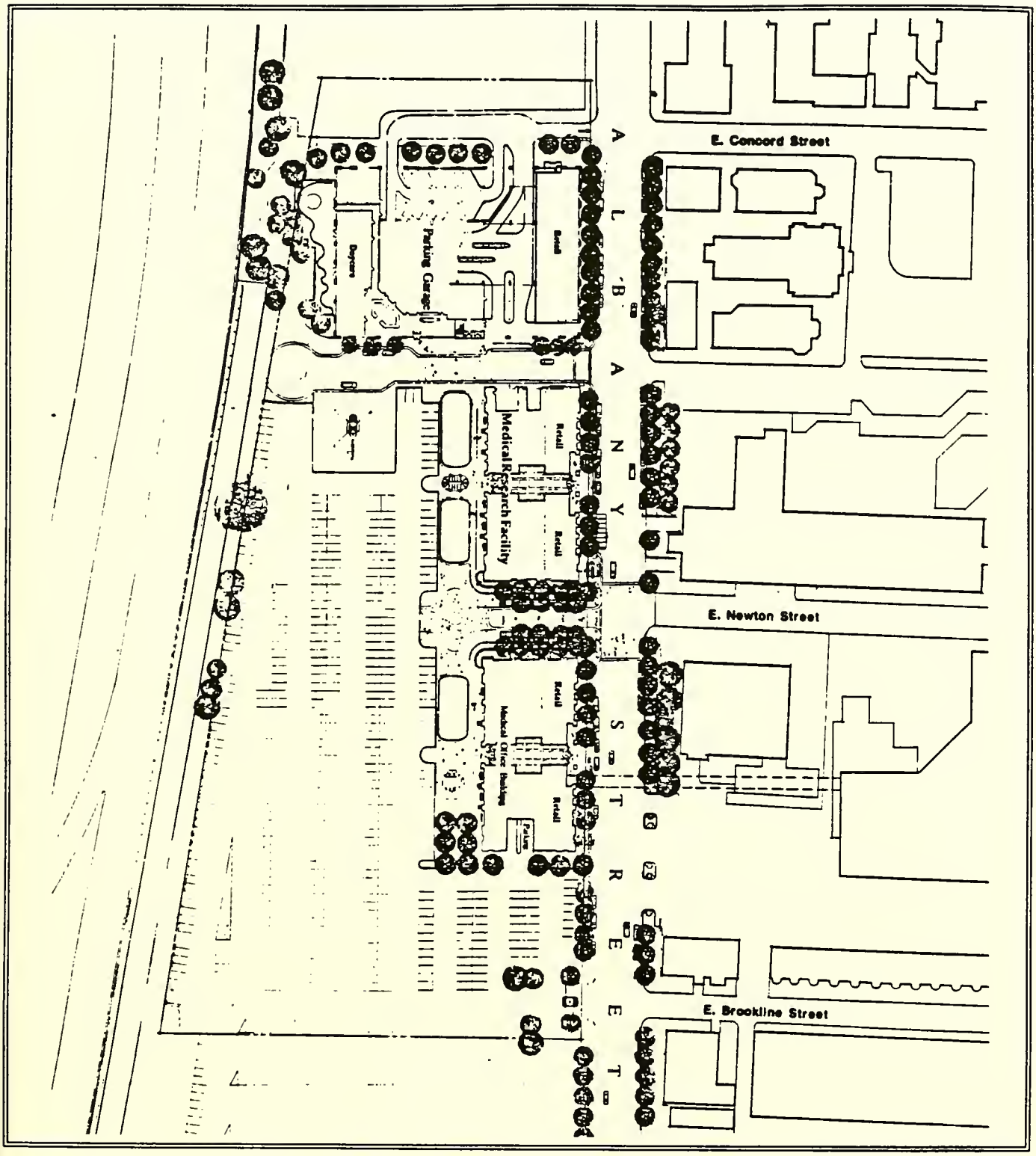
The building design employs brick and glazing materials which are compatible with the institutional and historical nature of the area. The two-story mechanical penthouse design reflects the lower level horizontal feature in a manner which enhances the overall building massing and design and conceals the mechanical systems. Exhibits 2-14 through 2-17 provide elevations and layout of Building 2.

Building 3, located on Parcel C, is a 160,000 s.f. medical office/ambulatory care building which includes 5,400 s.f. of retail space along Albany Street. It is 110 feet high and has a footprint of 20,000 s.f. This building has entrances along Albany Street and on the pedestrian plaza. This building will connect to the existing University Hospital via an upper level pedestrian bridge across Albany Street. This will allow additional outpatient care and ambulatory services to be provided as well as providing modern office facilities for the hospital physicians.

Phase I also includes landscaping and streetscaping of the buildings, Albany Street, and a portion of the pedestrian plaza. For this phase, the pedestrian plaza will include an expanse approximately 60 feet wide and 400 feet long to the rear of the buildings along Albany Street. Phase I also includes an intersecting expanse of approximately 80 feet wide and 140 feet long located between Building 2 (Biomedical Research building) and Building 3 (Medical Office). Landscaping for this phase will provide approximately 32,000 s.f. Following sections of this chapter discuss the design and landscaping in more detail.

Surface parking is retained on an interim basis on non-developed portions of the site during construction of Phase I and is phased out by completion of the project. The majority of parking is provided in Building 1 (Parking Garage). Additional parking may be developed under Building 3 (Medical Office), if subsurface conditions are compatible, or on an adjacent parcel. A detailed discussion of interim parking during construction of Phase I is provided in Section 6.0, Transportation.

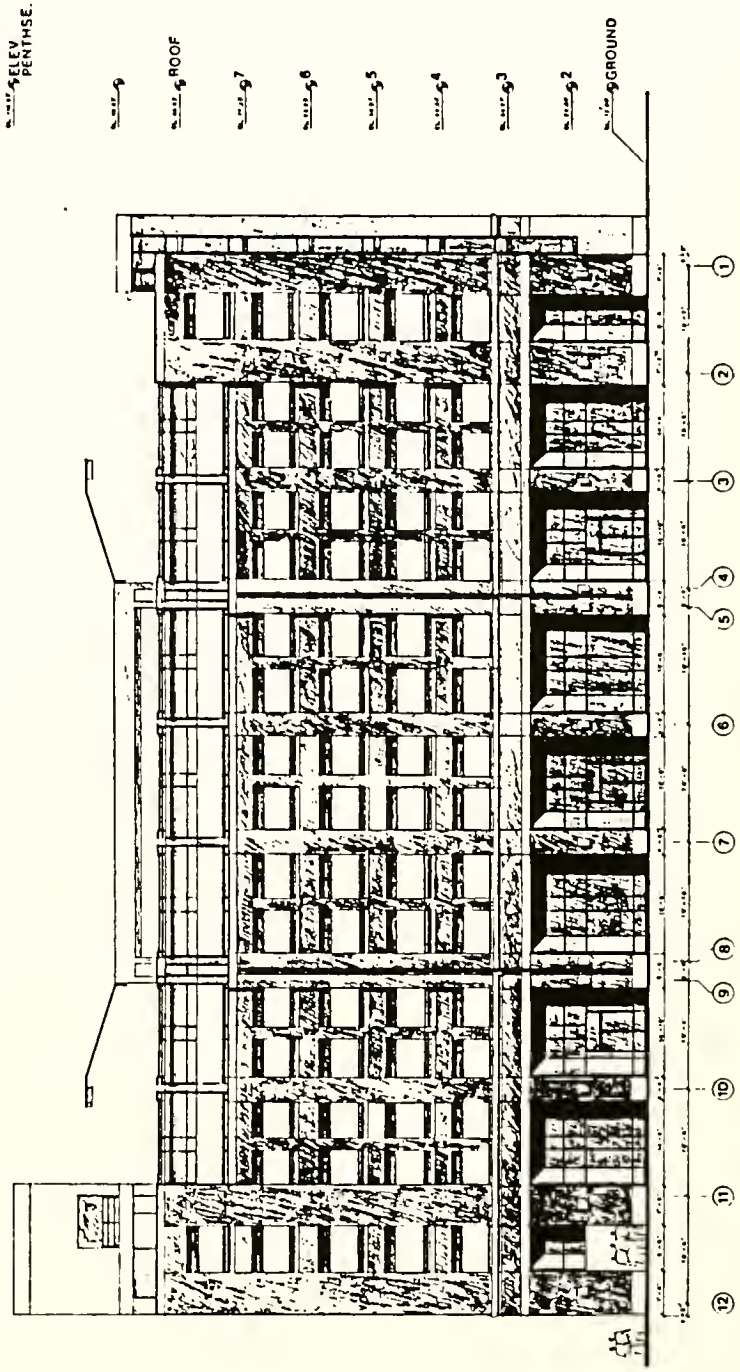
It is proposed that the helipad be provided on the project site in a mutually agreed upon location to Boston City Hospital and The Universtiy Hospital.



Site Plan Phase One

Prepared By:
Cambridge Seven Associates, Inc.

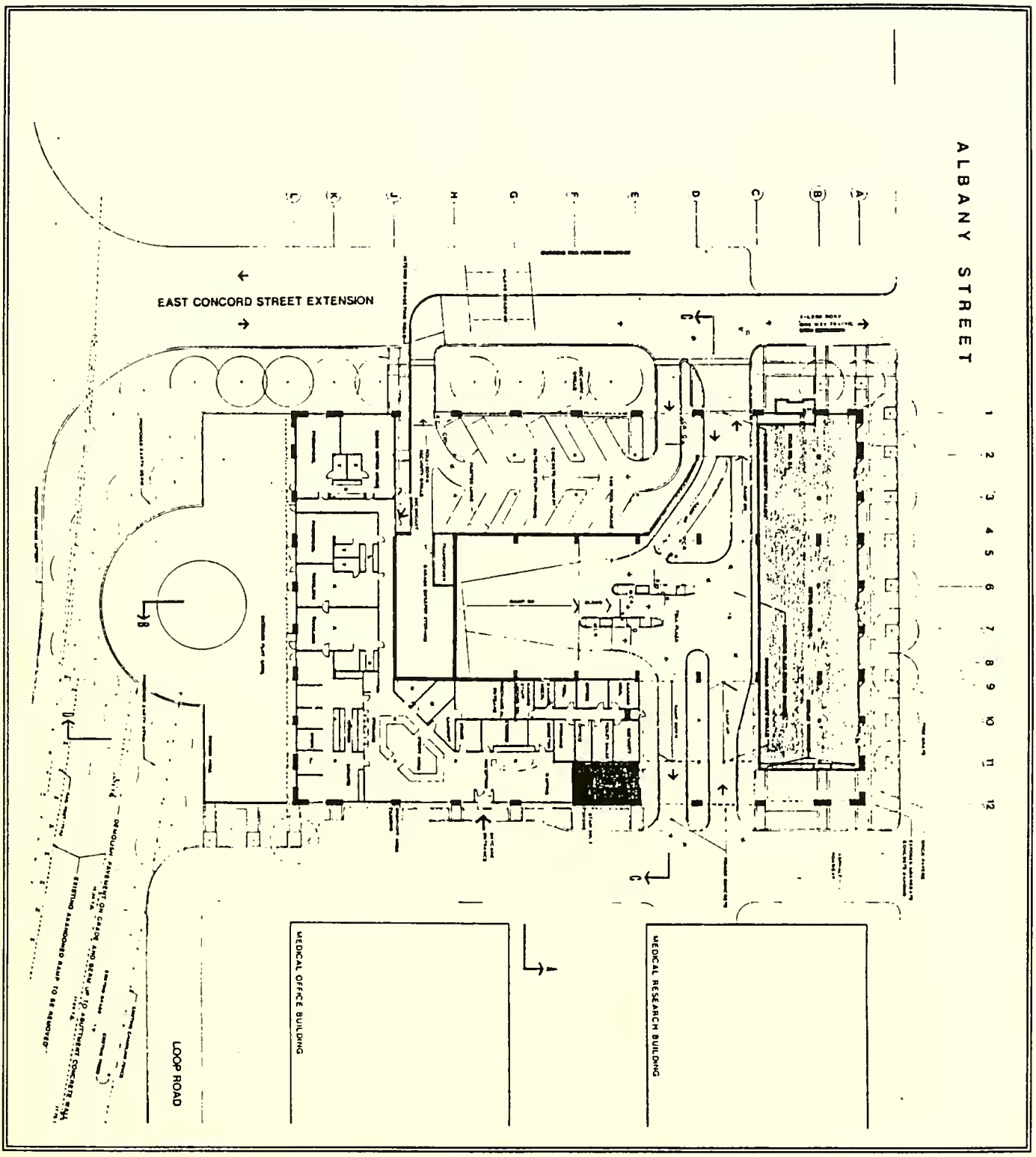
Exhibit 2 - 10



Building I - Albany Street Elevation

Prepared By:
Zaldistani Associates, Inc.

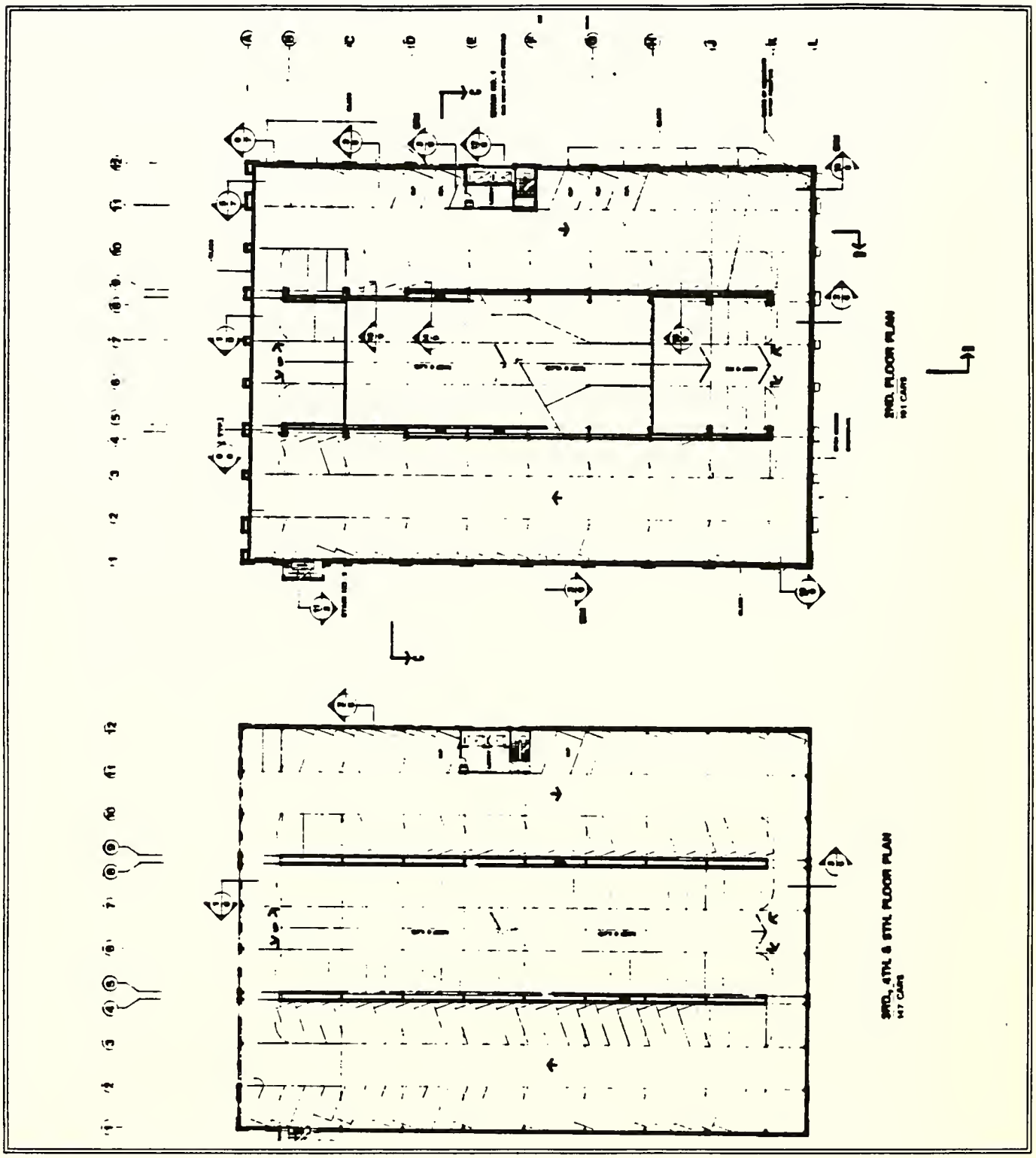
Exhibit 2 - 11



Building I - Ground Floor Plan

Prepared By:
Zaldistani Associates, Inc.

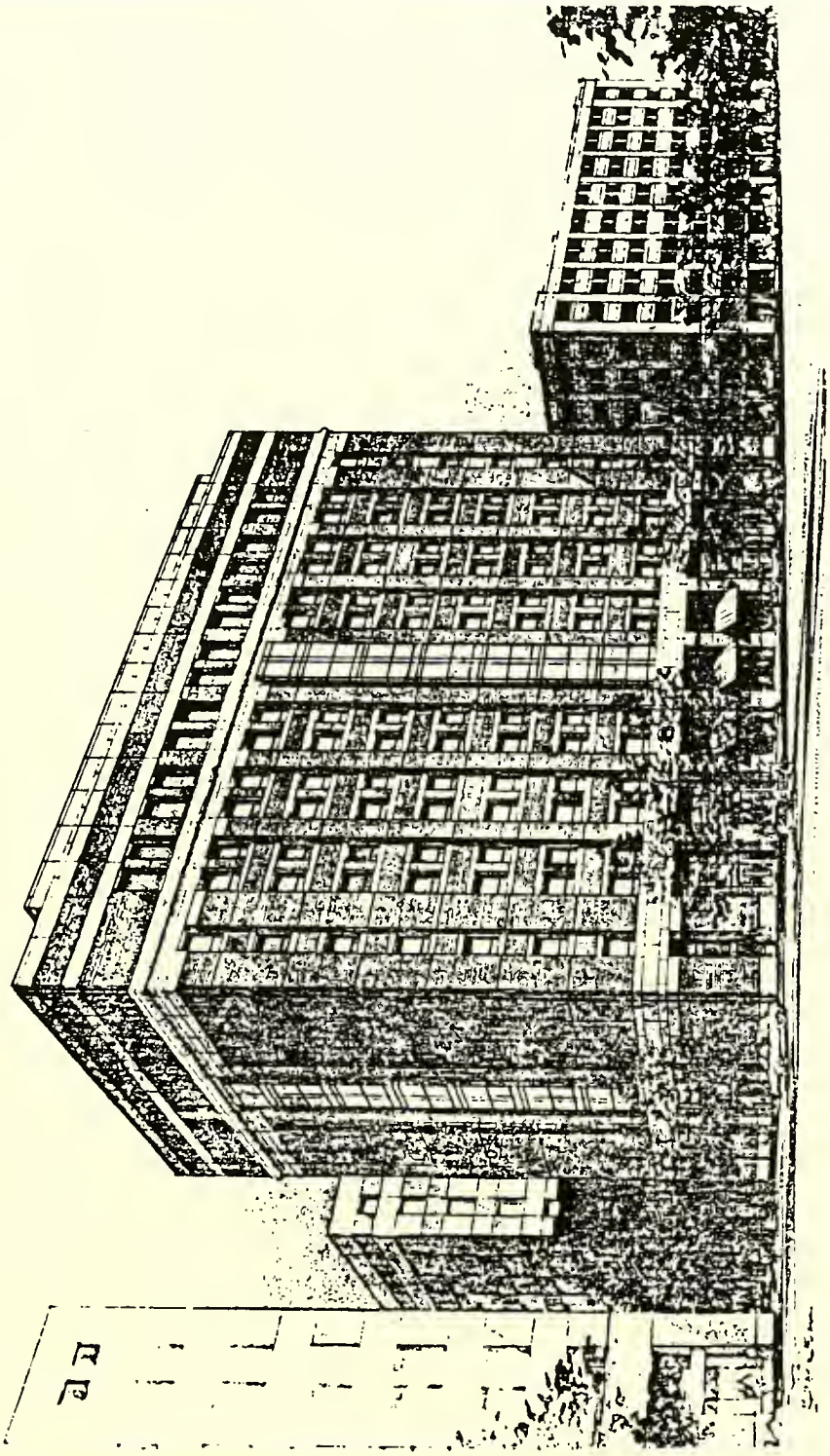
Exhibit 2 - 12



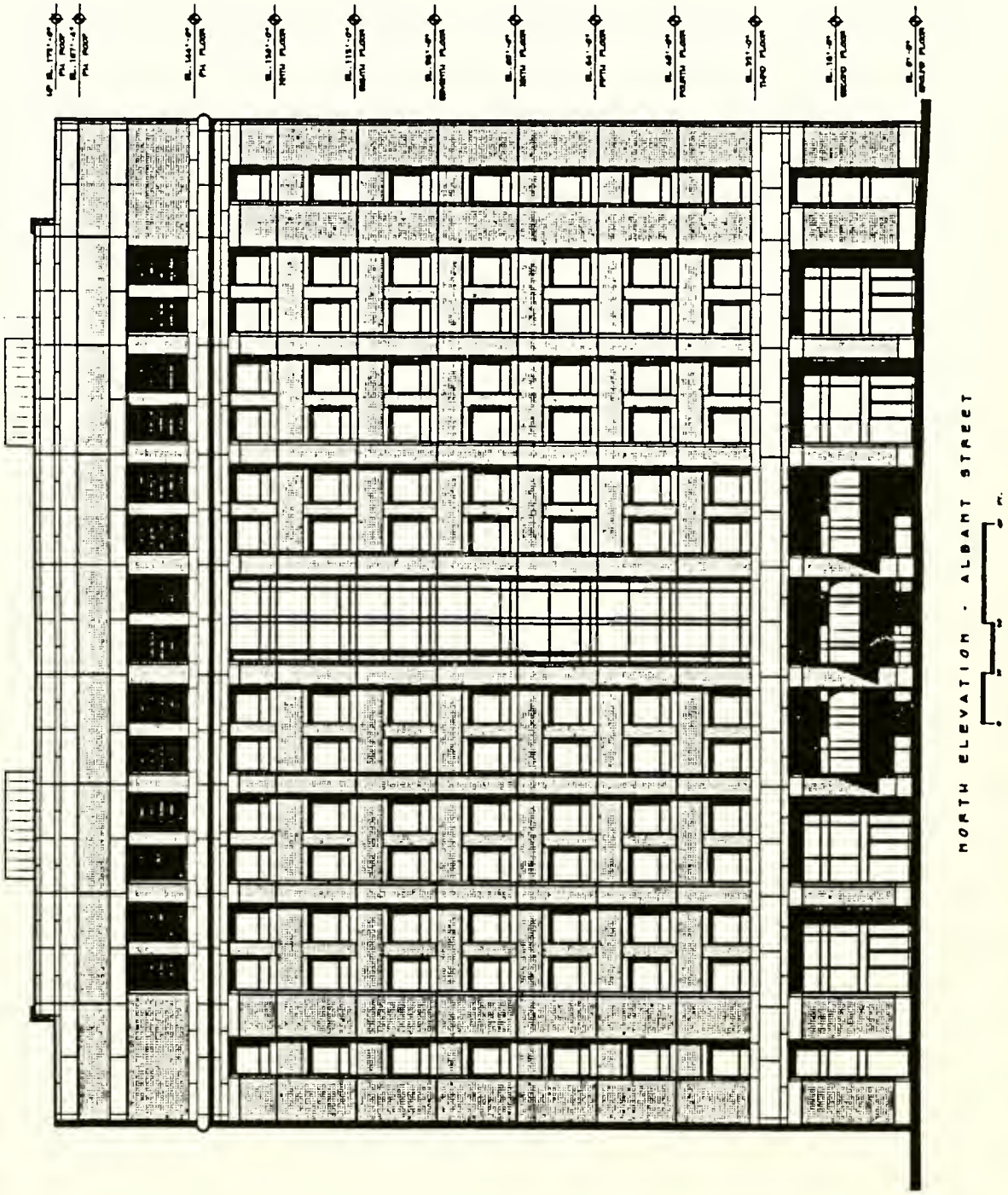
Building I - Typical Floor Plan

Prepared By:
Zaldistani Associates, Inc.

Exhibit 2 - 13



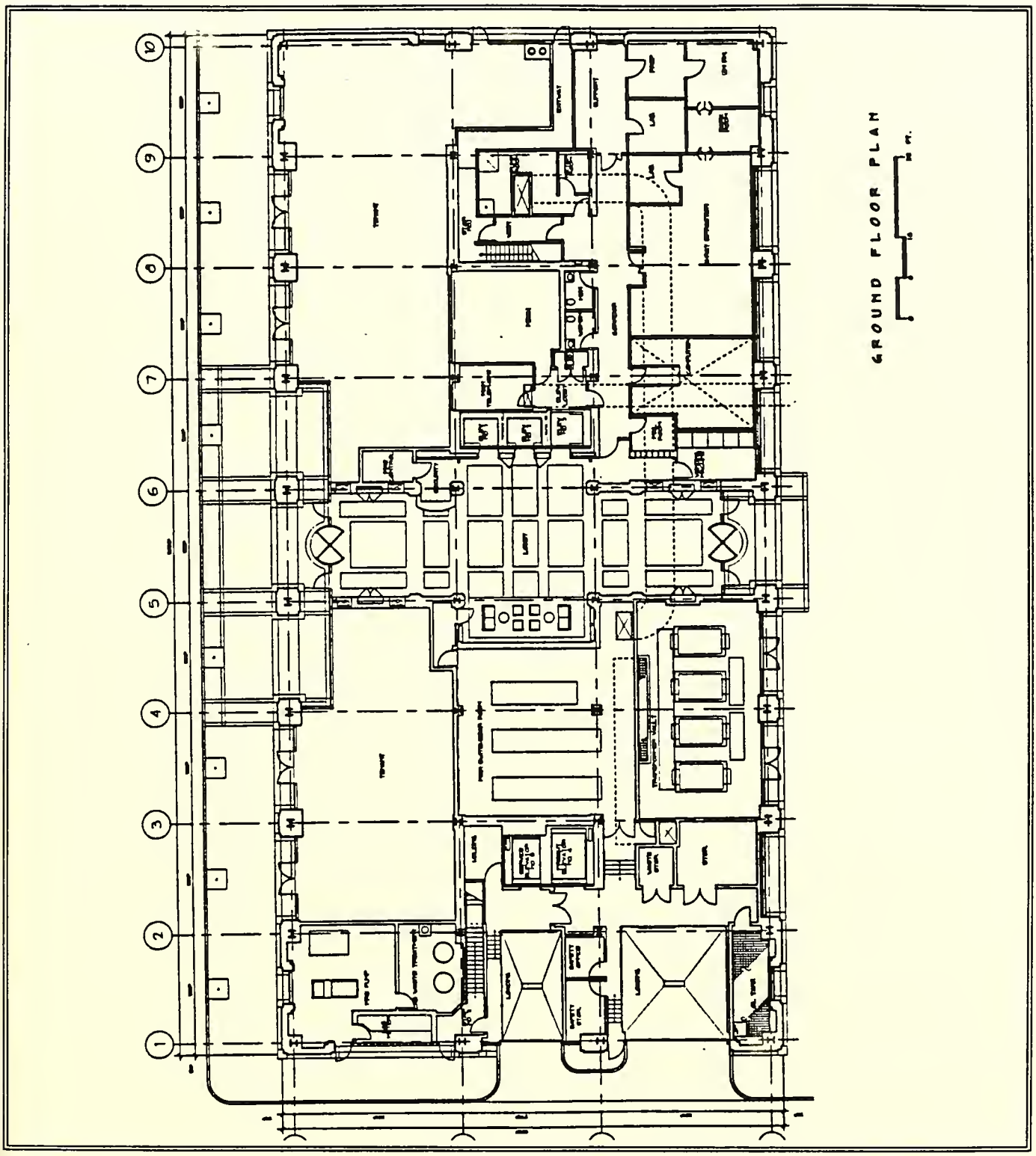
Building 2	
Prepared By: Cannon	**Exhibit 2 - 14**



Building 2 - Albany Street Elevation

Prepared By:
Cannon

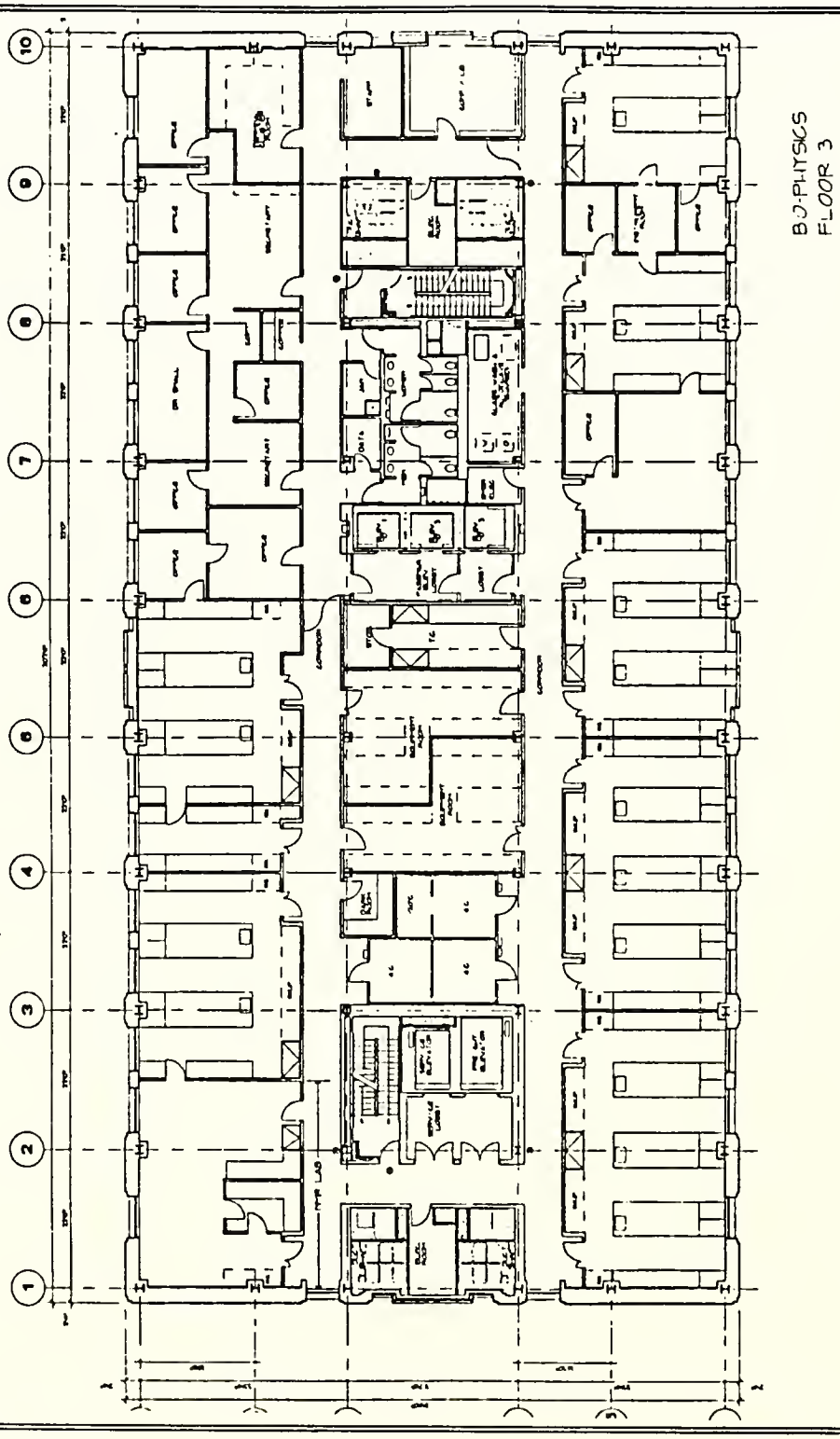
Exhibit 2 - 15



Building 2 - Ground Floor Plan

Prepared By:
Cannon

Exhibit 2 - 16



Building 2 - Typical Floor Plan

Prepared By:
Cannon

Exhibit 2 - 17

PHASE II

Phase II of the University Associates project consists of two research/office buildings, a 250 room hotel, completion of pedestrian plaza and landscaping features, proposed street improvements which compliment the Massachusetts Avenue Connector, relocation of the helipad, and additional parking. The design, massing, and materials used in these buildings reflect the characteristics of Phase I, remaining sympathetic to the historic and institutional character of the area and promoting activity along Albany Street. Exhibit 2-18 illustrates the Full-Build Site plan. The Full-Build concept is illustrated in Exhibits 2-19 and 2-20.

Buildings 4 and 5 are located on Parcels D and E respectively. Both buildings face the Massachusetts Avenue Connector. They contain north and south entrances facing the Massachusetts Avenue Connector and the pedestrian plaza. Building 4, a 140,500 s.f. research/office building, is 110 feet high and has a footprint of 20,000 s.f. Building 5 is a 160,000 s.f. building with a 20,000 s.f. footprint.

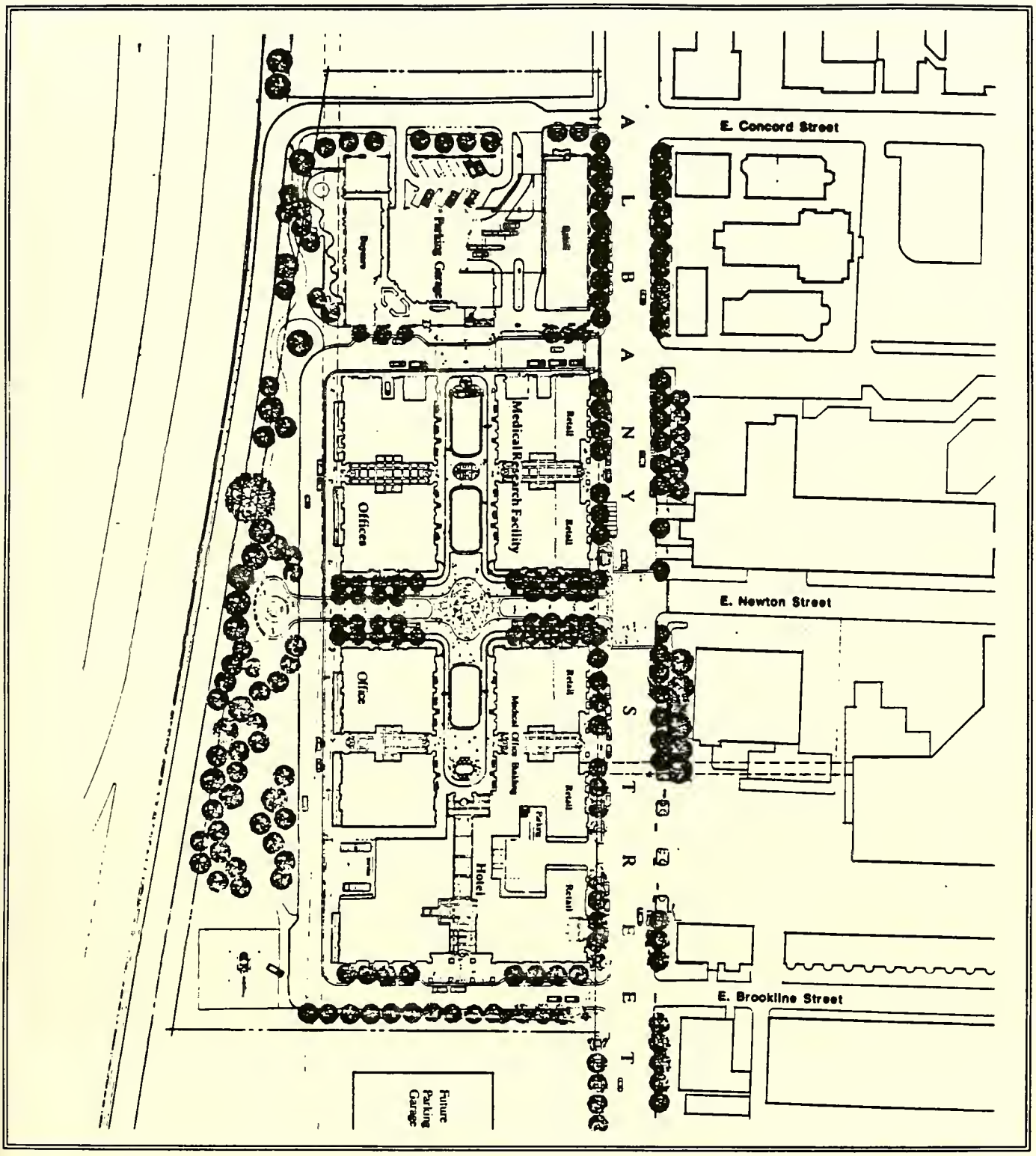
Building 6, sited on Parcel F, is a 250 room hotel with a 180 seat restaurant and associated function facilities. The building is 100 feet high and has a footprint of 27,000 s.f. Entrances are located along Albany Street and on the proposed East Brookline Street extension on the east side of the site. There is also a restaurant facing the new pedestrian plaza.

Buildings 3 and 5 and the hotel are serviced from a new road on the east side of the buildings. Building 4 is serviced on the west side.

Other program features of Phase II include completion of the pedestrian plaza and all landscaping and street furniture elements within the site and along Albany Street. Included in the open space plan for Phase II is the extension of the pedestrian plaza between Buildings 4 and 5. This faces toward the new Massachusetts Avenue Connector and is approximately 80 feet wide and 120 feet long. At Full-Build, the pedestrian plaza will total approximately 42,000 s.f. In addition to the pedestrian plaza, approximately two acres of land along the perimeter of the site and the new Massachusetts Avenue Connector will be open space and landscaped. Bike and pedestrian paths will also be incorporated into this area.

East Concord Street and East Brookline Street extensions will be completed, as well as the service drive through the site. By the completion of the project, surface parking will be eliminated from the development site. At Full-Build, an additional 1,265 parking spaces are accommodated through a combination of structured

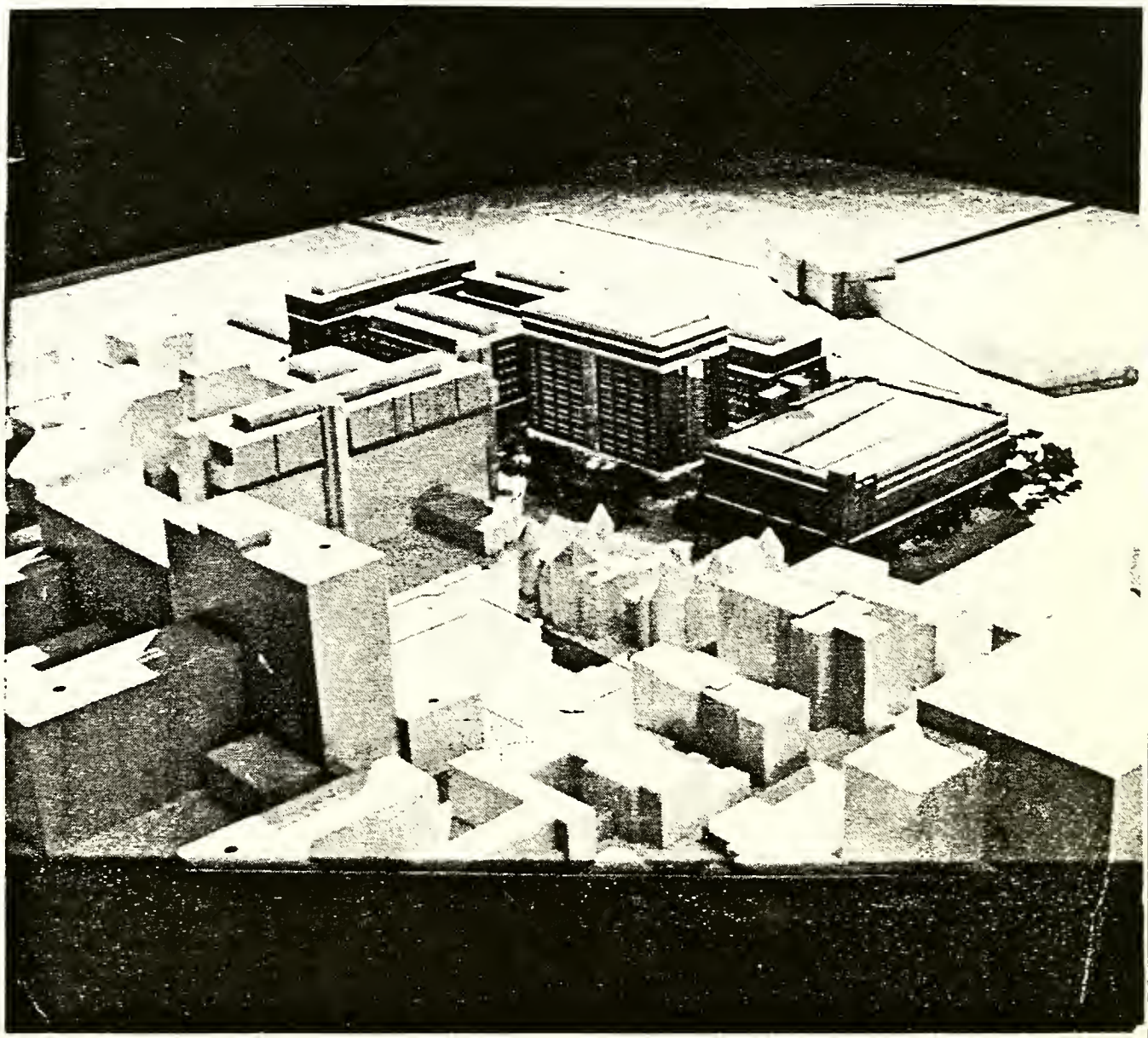
parking in a second garage and/or on the lower levels of buildings where subsurface conditions are compatible. It is contemplated that the second garage be located at an adjacent parcel (600 Albany Street) which is under control of the proponent. The helipad will be relocated to the southeast corner of the site.



Full Build Site Plan

Prepared By:
Cambridge Seven Associates, Inc.

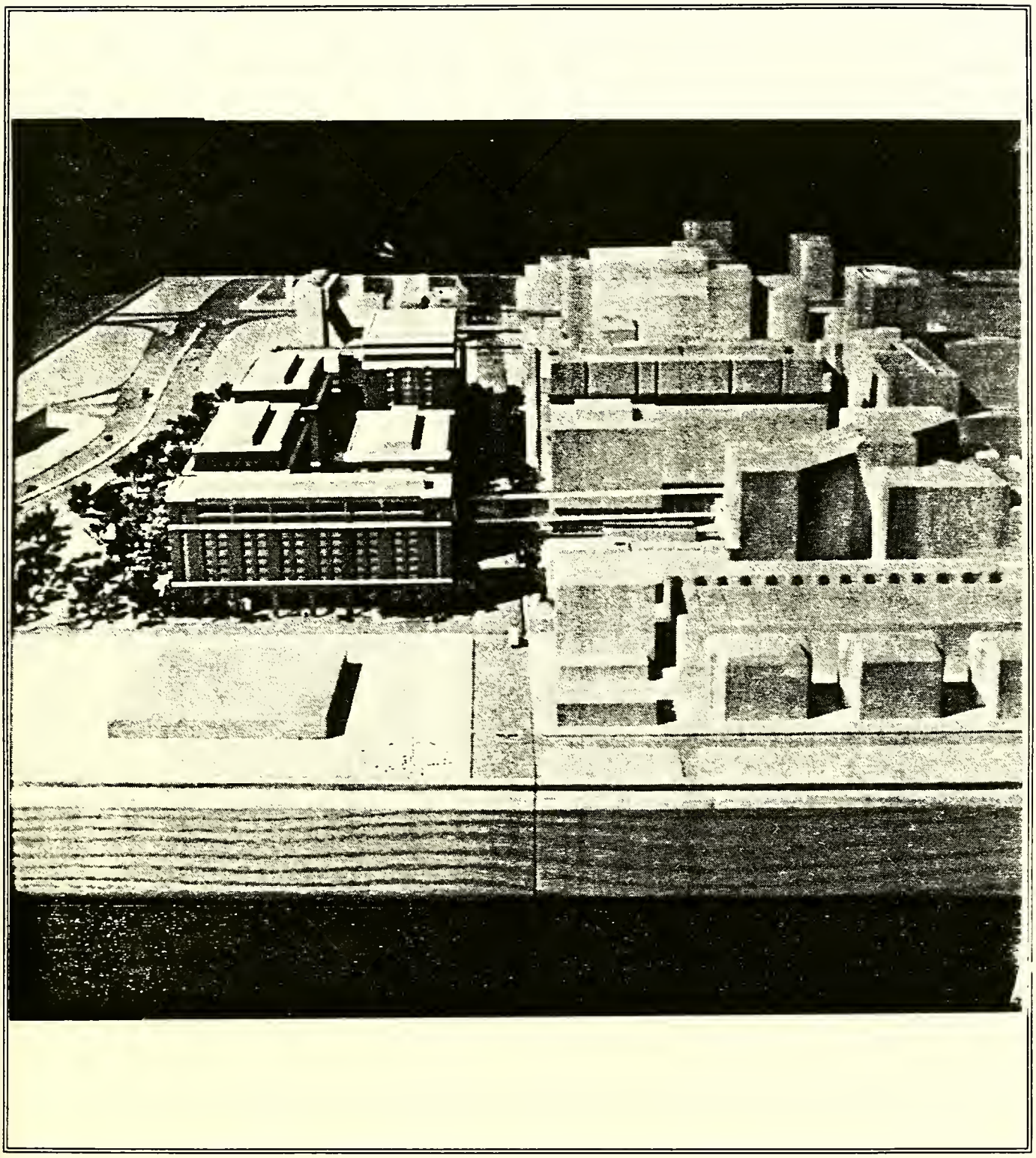
Exhibit 2 - 18



Full Build Concept Looking South

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 2 - 19



Full Build Concept Looking West

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 2 - 20

2.6.2 CIRCULATION AND URBAN FABRIC

The University Associates project seeks to reinforce the urban fabric of the area and the existing street system while simultaneously protecting the neighborhood from an increase in through traffic. The site plan is sympathetic to the character of the area:

- Buildings are arranged to be compatible with the area in terms of views, street system and connections to existing medical facilities.
- Site access points and new streets are aligned with the existing street system.
- Retail uses are situated along Albany Street.
- Pedestrian plaza and open spaces are designed to maximize views to and from the South End as well as to contribute to the boulevard character desired for the new Massachusetts Avenue Connector.

Vehicular System

Access will be provided through the site from Albany Street and the extension of East Brookline Street, which connects to a perimeter service road on site. This road will be limited to service and emergency vehicles; general traffic will be prohibited. Circulation through the site accommodates servicing and loading and pick-up and drop-off away from Albany Street and the new Massachusetts Avenue Connector. Loading and servicing areas consist of six off-street areas as shown on Exhibit 2-21. All loading and servicing activities will occur off-street. These facilities can serve from 8 to 13 delivery vehicles at a time depending on the size of the vehicle. Additional traffic and circulation information can be found in Section 6.0, Transportation.

East Concord Street is proposed to extend south of the garage to connect to the new Massachusetts Avenue Connector. This will allow traffic direct access to the garage off the new Massachusetts Avenue Connector and Albany Street. To protect the neighborhood from excessive through traffic, a section of the East Concord Street Extension will be made one-way.

Pedestrian Circulation

The project contributes greatly to pedestrian activity and safety in the area by bringing more people to the site and through the creation of mixed-use activities.

Pedestrian activity along Albany Street will be encouraged and stimulated through location of retail uses in each building on Albany Street, as well as the hotel and office entrances.

The alignment of the pedestrian plaza with the existing South End street system make the internal open space and pedestrian areas within the site consistent with the neighborhood street pattern. Additional open space opportunities along the new Massachusetts Avenue Connector are created and linked to the pedestrian plaza.

East Newton Street will be extended through the site as the north-south axis of the pedestrian plaza. This design capitalizes on the opportunity to provide a "gateway" view to the South End from the new Massachusetts Avenue Connector.

There will be a pedestrian bridge over Albany Street from Building 3 to The University Hospital providing a direct link from the project to the BUMC campus. See Exhibit 2-22.

Landscape Features

An essential element in the character of the development is the provision for pedestrian plazas and open space within the campus. The project includes rich landscape vocabulary in the pavers, cobblestone, plantings, lighting, signage and other street furniture throughout the site. Brick pavers, canopies and signage are used to emphasize building entrances and style. Lighting fixtures promote the building image, as well as safety. The project creates approximately two acres of landscaped open space around the perimeter of the site. This includes open space along the new Massachusetts Avenue Connector plus approximately 42,000 s.f. in the pedestrian plaza which disects the site in an east-west and north-south axis.

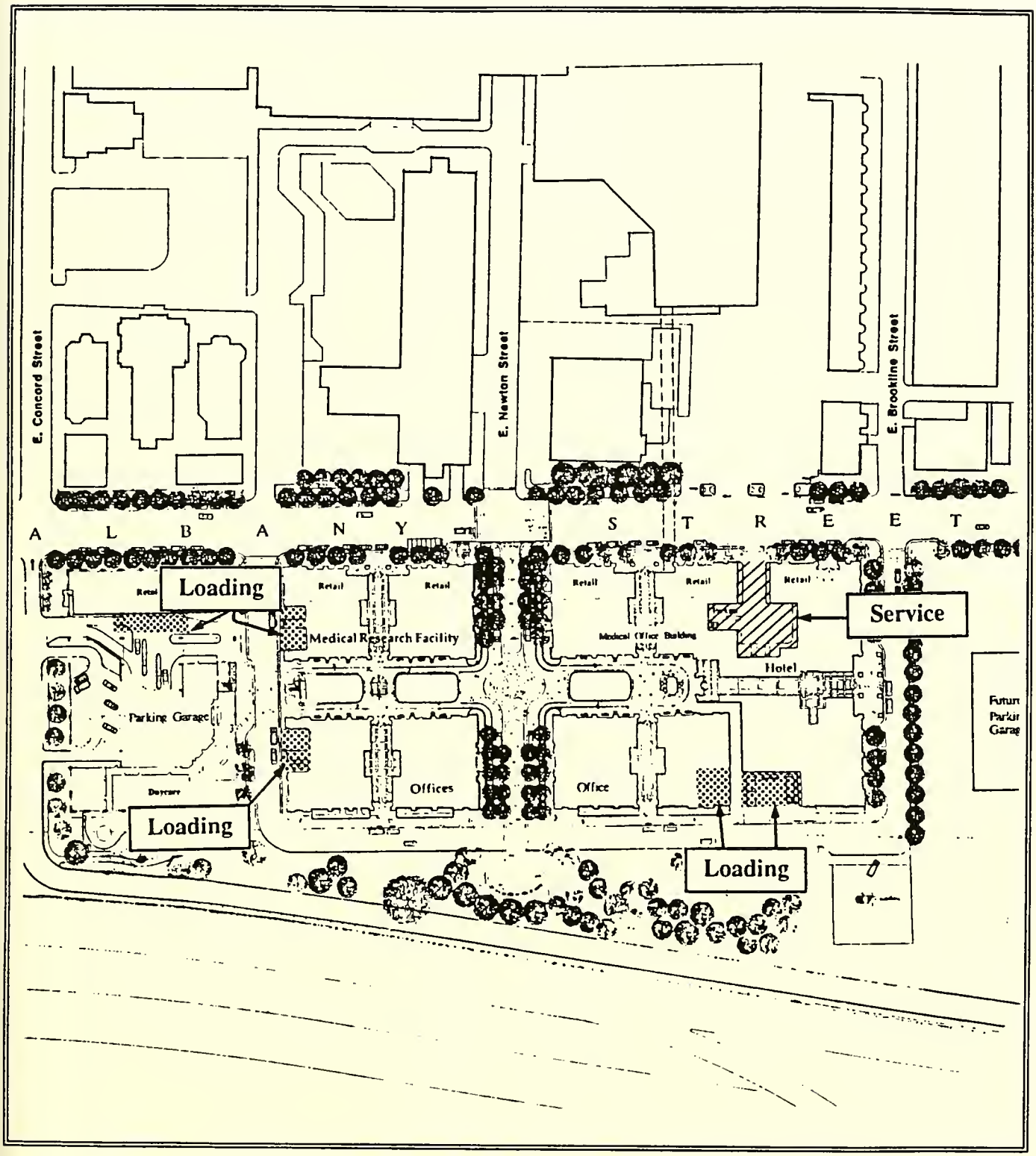
The pedestrian plaza involves a combination of grass and large and small trees in raised planters placed in a geometric pattern which is coordinated with building entrances. Water features, benches and other street furniture are also integrated into the pedestrian plaza design. For emphasis, special trees and street furniture are situated at the gateway as well as at the hotel entrances.

The design takes advantage of the open space opportunities along the new Massachusetts Avenue Connector which is planned to be a generous boulevard. This open area will contain a combination of grass, large canopy trees and some smaller trees and will incorporate bicycle and pedestrian paths. The landscape plan includes a planting buffer zone between the project and the new Massachusetts Avenue Connector. Plantings will be added along the edge of the Connector upon

completion. Although the development program includes an on-site service road, the internal area of the campus is designed primarily for pedeatrian use.

In keeping with Albany Street's role as a major street, the project offers strong features such as large trees and street furniture. These features enhance the pedestrian character of the street and serve to identify the building and site entrances. See Exhibits 2-23.

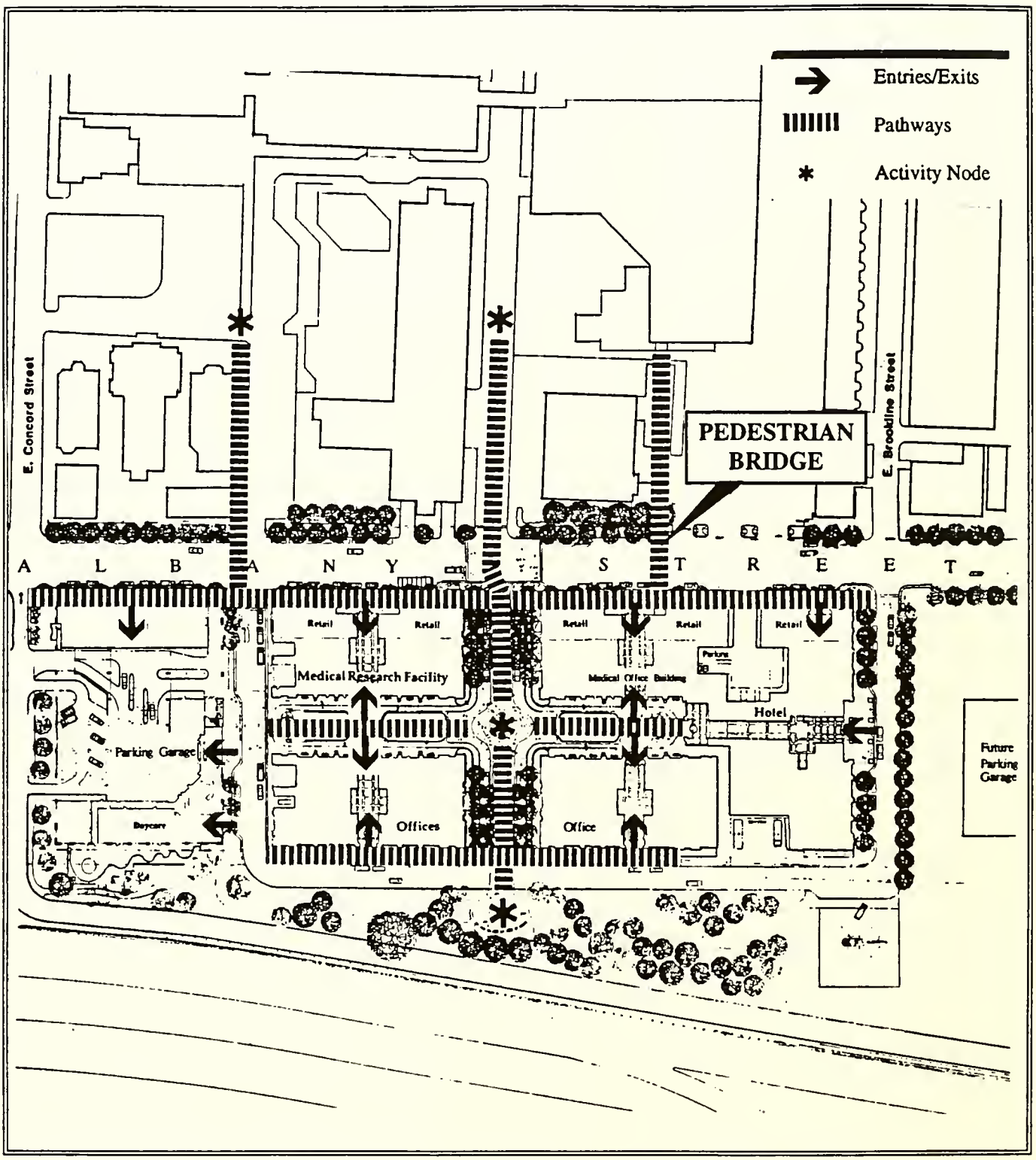
The daycare center requires privacy and security from other uses and activities on the site. However, optional access to the pedestrian plaza and open space along Massachusetts Avenue connector will be provided. A minimum eight foot high solid fence will be placed along the perimeter of the daycare outdoor play area for security and to provide a buffer from the Massachusetts Avenue Connector and East Concord Street extension. Shade trees will be located so as to provide additional buffering to the Massachusetts Avenue Connector and provide shade to the outdoor play area.



Service and Loading Areas

Prepared By:
Vanasse Hangen Brustlin, Inc.

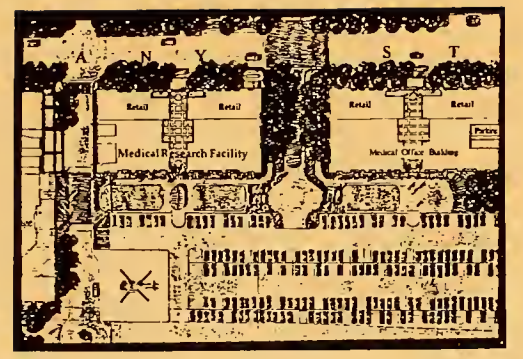
Exhibit 2 - 21



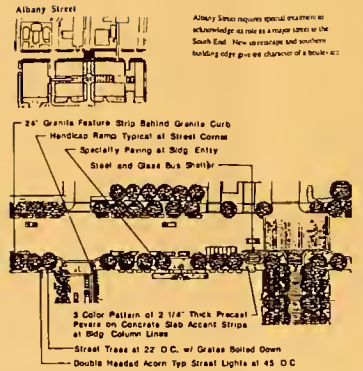
Pedestrian Circulation

Prepared By:
Vanasse Hangen Brustlin, Inc.

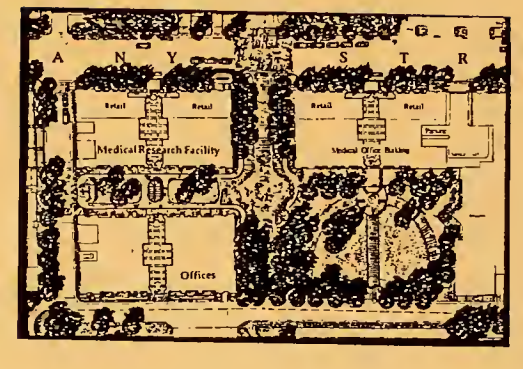
Exhibit 2 - 22



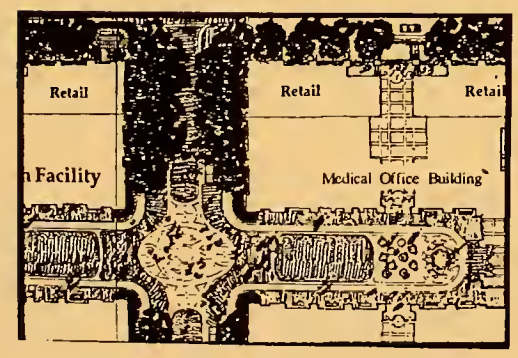
Phase I Landscape Plan



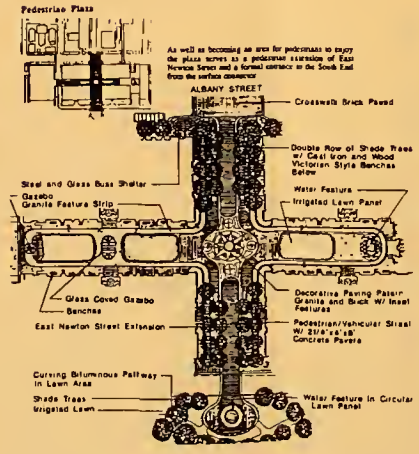
Albany Street Landscape Details



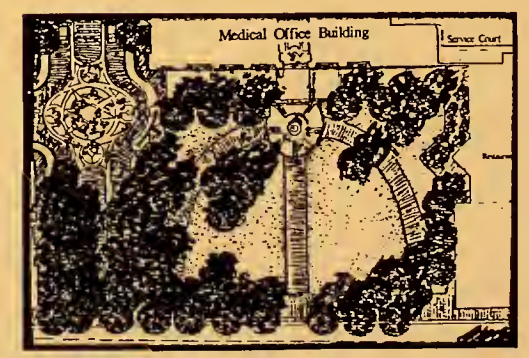
Phase II Option Landscape Plan



Phase I Plaza Detail



Pedestrian Plaza Landscape Details



Phase II Park Detail

UNIVERSITY ASSOCIATES

Landscape Features

Exhibit 2 - 23

Prepared by:
William Pressley Associates

NOVEMBER 1991

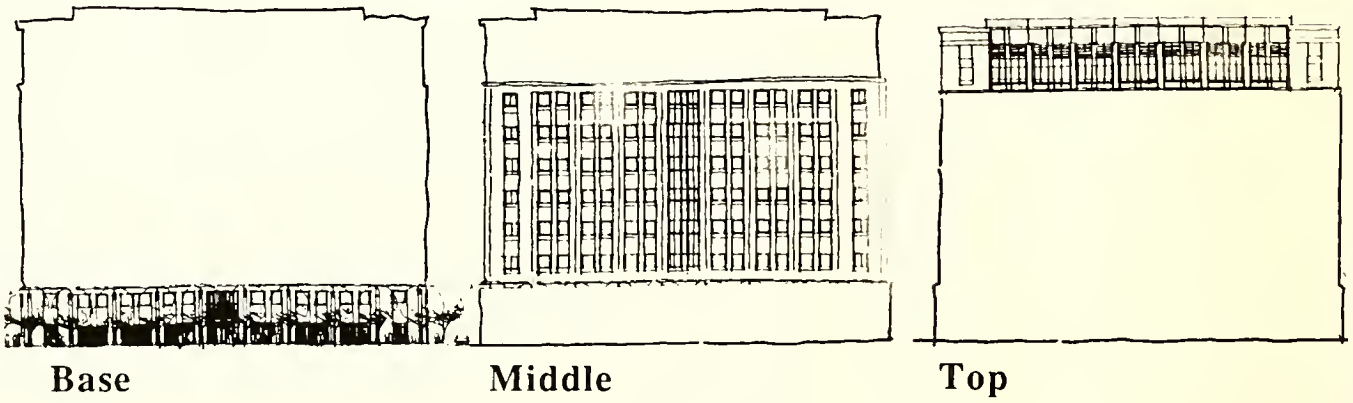
2.6.3 MASSING AND FACADE

Facade guidelines were developed to create a cohesive, ordered building ensemble and building characteristics which are sympathetic to the South End neighborhood history and vitality. The designs reflect both the historic light industrial buildings of the South End and the early Boston University School of Medicine buildings. (The history of the area is discussed in more detail in the DEIR.)

The building facades are divided into three horizontal sections:

> **Base** - The base consists of two stories with the ground level being a transparent glazed arcade with articulation of piers and corners.
>
> **Middle** - The middle is separated from the Base and Top by relief and banding. Vertical expression is emphasized by proportion of windows, brick relief at column lines and solid corner elements.
>
> **Top** - The top completes the facade through the use of special materials and window treatments, louvers, banding and other brick relief. The penthouse elements, if visible, are incorporated into the top facade.

The massing of the buildings themselves are also in keeping with the size and shape of historic buildings in the area and employ similar techniques to deal with horizontal and vertical elements. The massing is reduced by implementation of architectural elements and expression in the facade which add vertical vocabulary to the buildings. The edges of the buildings are articulated with more solid materials offering more definition. The horizontal feeling is broken up by window size and spacing. Also, column bays and pilasters are placed every 20 feet to add to the vertical vocabulary. The center section of the taller buildings will have a glazed curtain wall element centered over the entrances providing a focus for attention. The penthouse will be integrated into the facade design through use of similar materials and modulation of louvers to align with the windows below. See Facade Guidelines and Elevations in Exhibits 2-24 and 2-25. Exhibits 2-26 - 31 provide before and after sketches of key areas near the project.

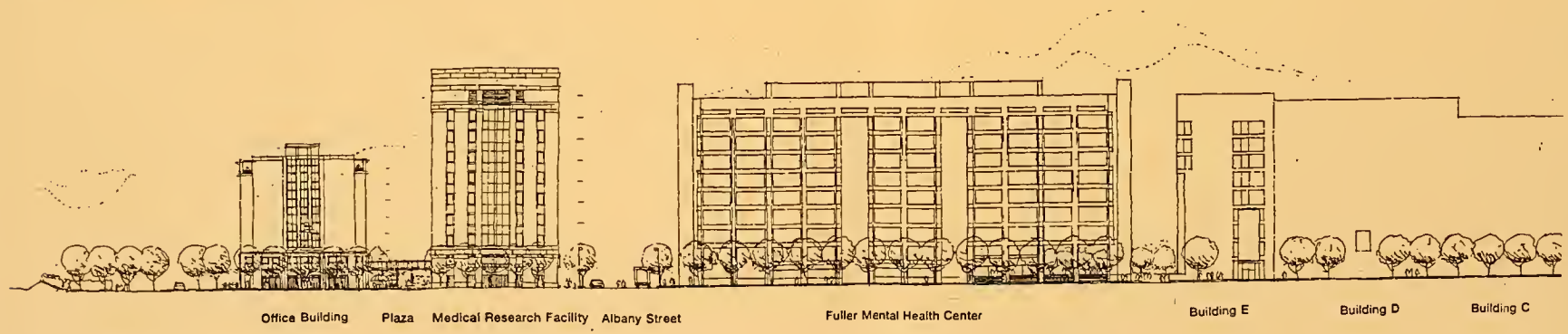


Facade Guidelines

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 2 - 24

Albany Street Elevation



East Newton Street Elevation

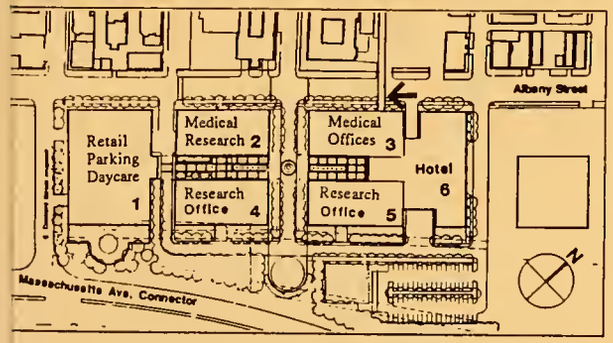
UNIVERSITY ASSOCIATES

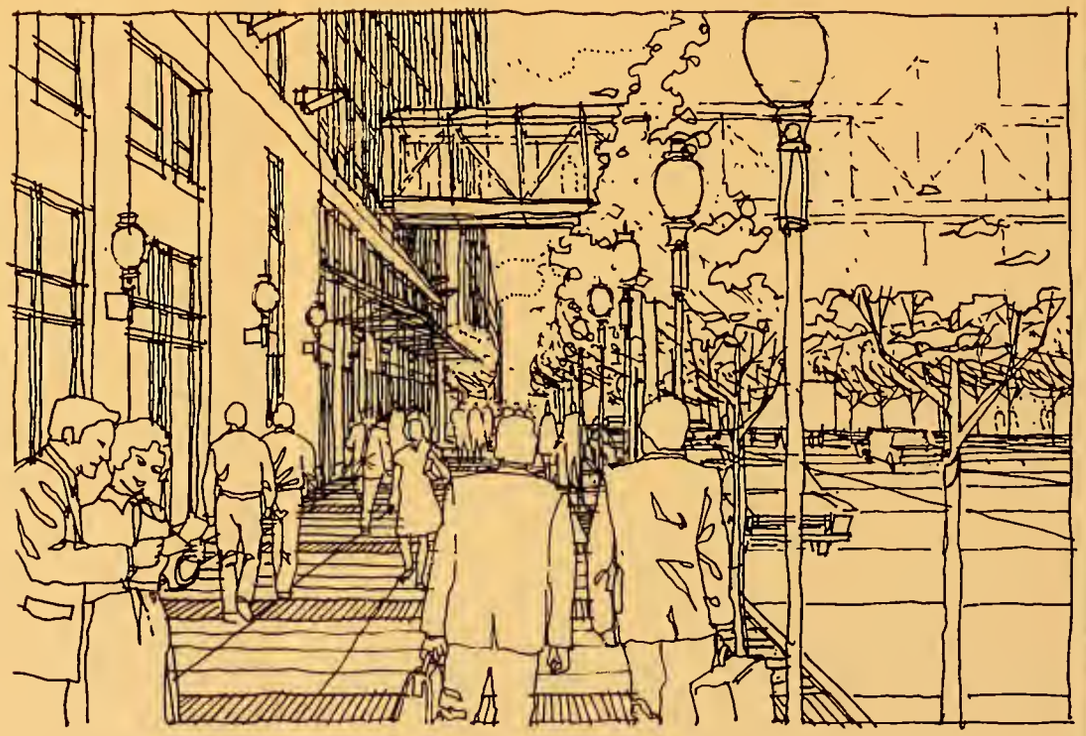
Facade Elevation

Exhibit 2 - 25

Prepared by:
Cambridge Seven Associates, Inc.

NOVEMBER, 1991





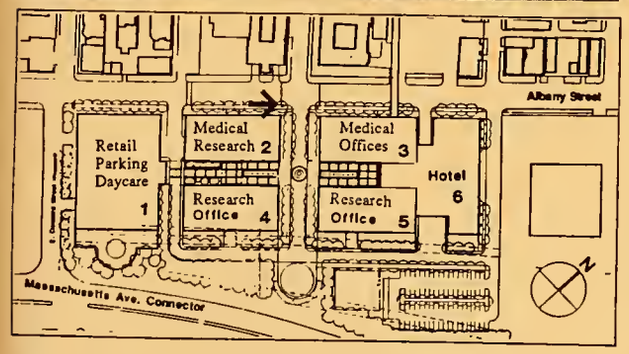
UNIVERSITY ASSOCIATES

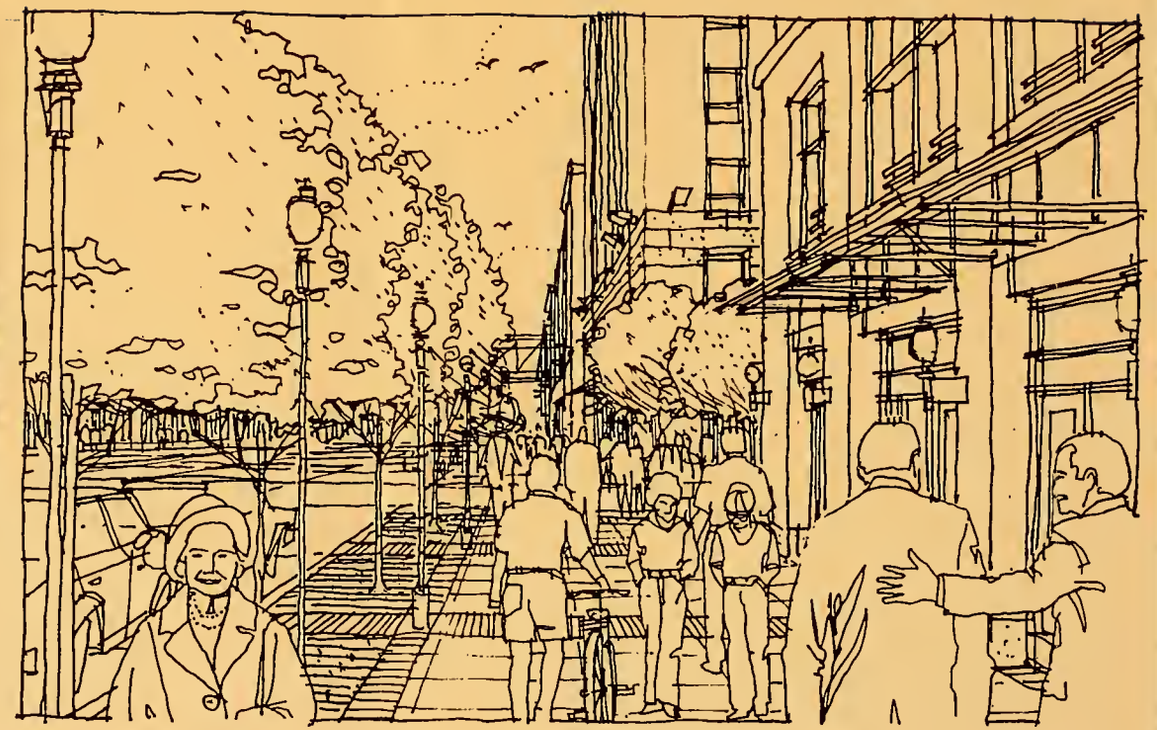
Albany Street
Looking West

Exhibit 2 - 26

Prepared by:
Cambridge Seven Associates, Inc.

NOVEMBER, 1991





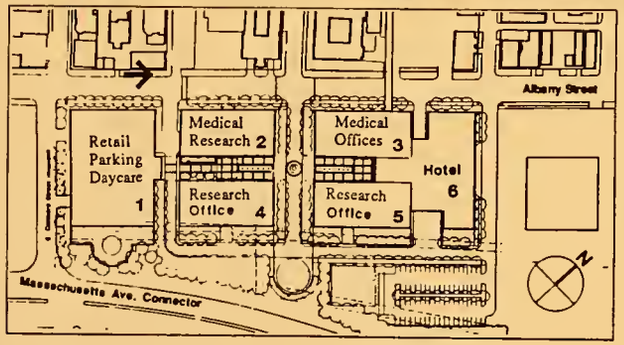
UNIVERSITY ASSOCIATES

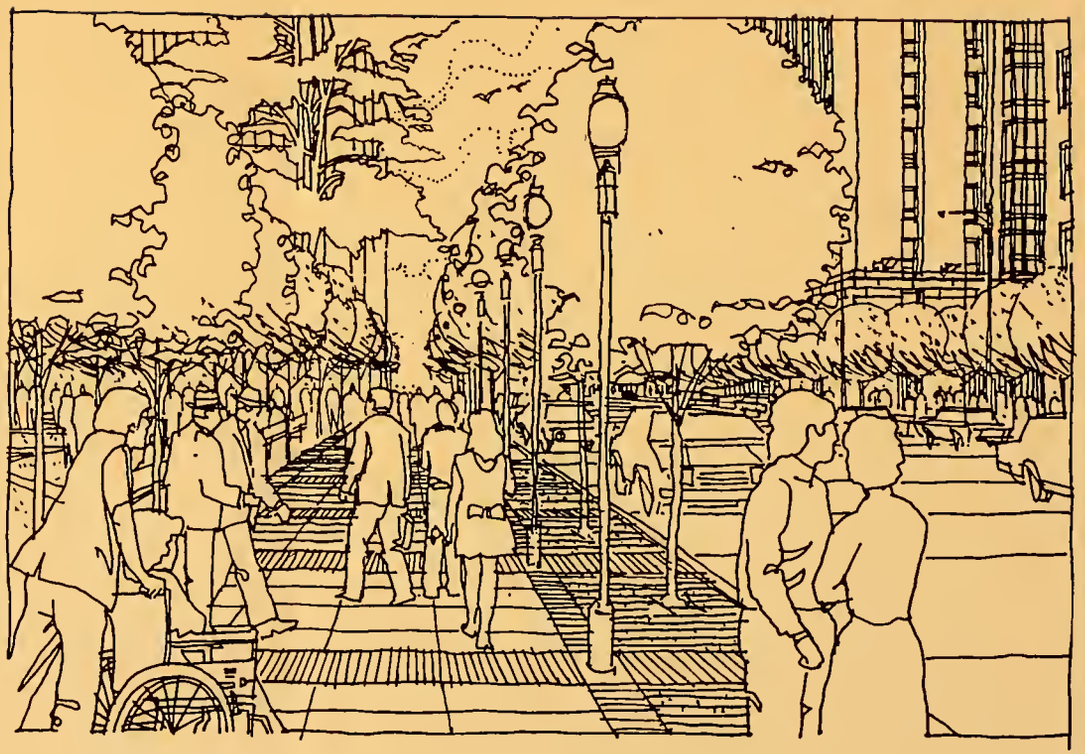
Albany street
Looking East

Exhibit 2 - 27

Prepared by:
Cambridge Seven Associates, Inc.

NOVEMBER, 1991





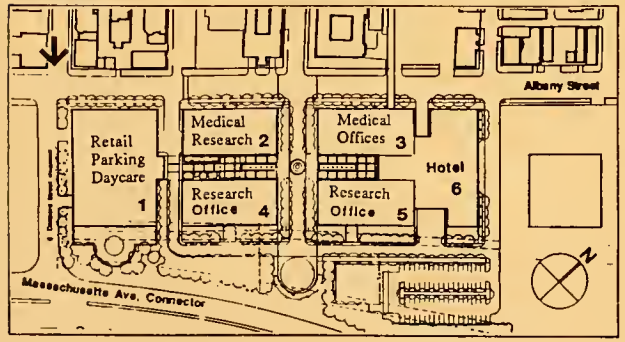
UNIVERSITY ASSOCIATES

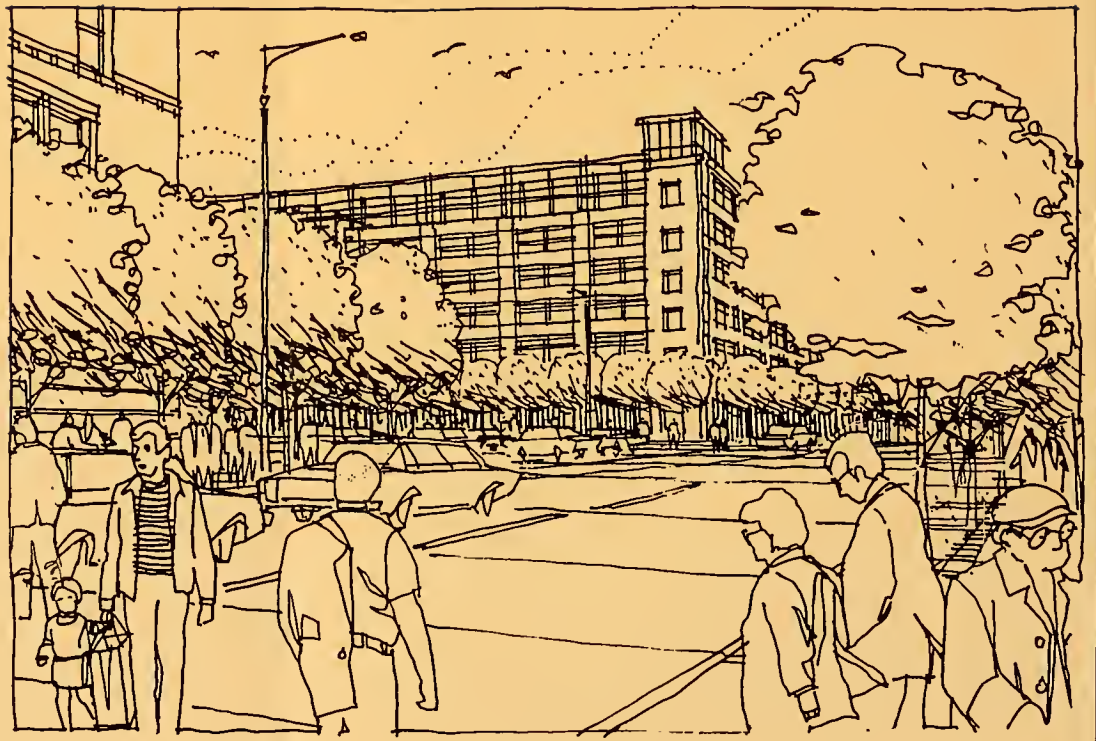
Albany Street
Looking East

Exhibit 2 - 28

Prepared by:
Cambridge Seven Associates

NOVEMBER, 1991





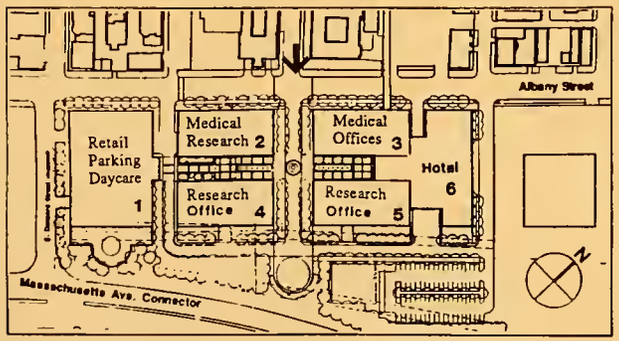
UNIVERSITY ASSOCIATES

East Concord Street Toward Site

Exhibit 2 - 29

Prepared by:
Cambridge Seven Associates, Inc.

NOVEMBER, 1991



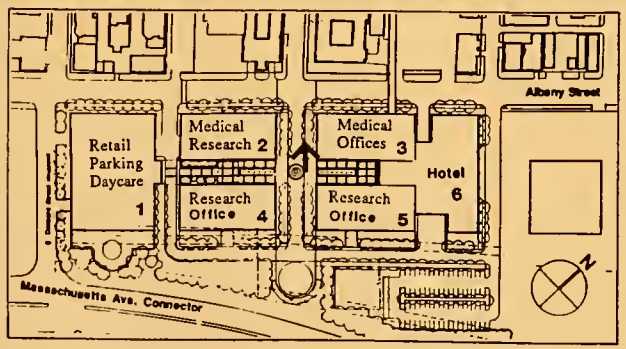
UNIVERSITY ASSOCIATES

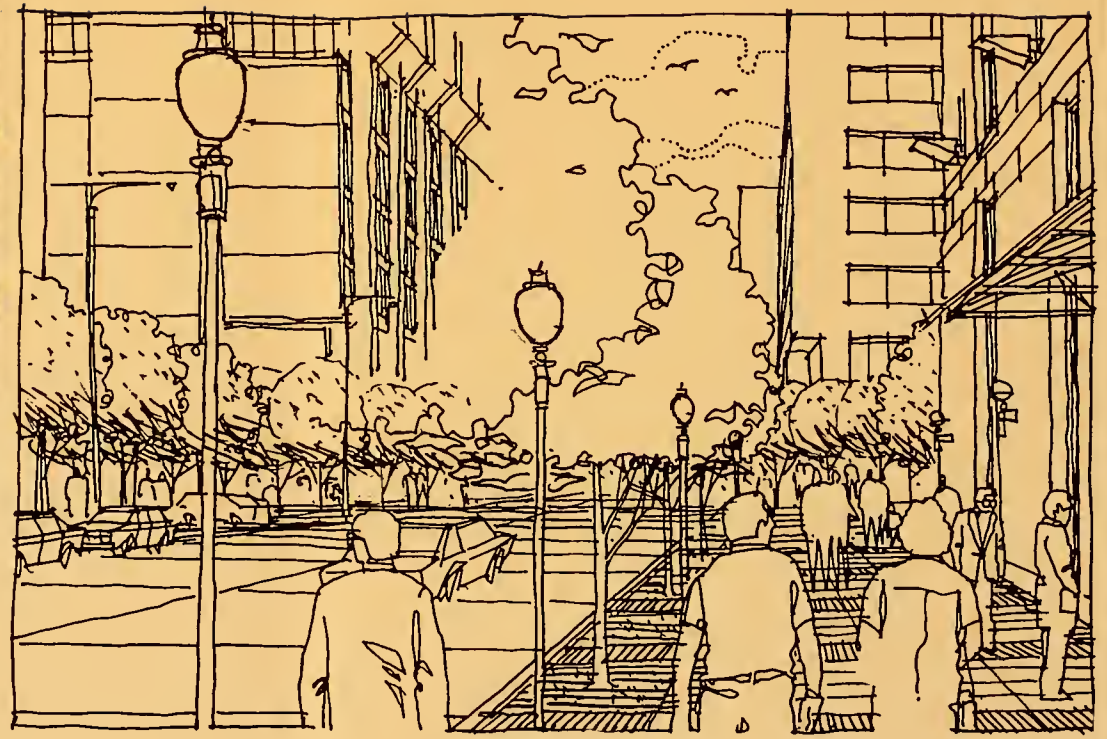
East Newton Street
From Site

Exhibit 2 - 30

Prepared by:
Cambridge Seven Associates, Inc.

NOVEMBER, 1991





UNIVERSITY ASSOCIATES

East Newton Street
Toward Site

Exhibit 2 - 31

Prepared by:
Cambridge Seven Associates, Inc.

NOVEMBER, 1991

Federal revenues will be generated through Social Security Taxes, Federal Unemployment Taxes, and Federal Income Taxes as a result of the construction and permanent employment generated by the project.

2.7.2 JOB TRAINING

The University Associates project is estimated to generate $725,300 for job training in the City of Boston in addition to the educational and training programs currently offered by BUMC as described in Section 1.0, Project Summary.

2.7.3 HOUSING LINKAGE

The University Associates project is estimated to generate $3,626,500 for housing in the City of Boston.

2.7.4 COMMUNITY DAYCARE

The University Associates project will provide new daycare space for approximately 100 children. This facility will be available largely to employees of BUMC but one third of the slots will be reserved for Boston City Hospital (BCH) employees and neighborhood families who are not employees of BUMC. Based upon an expected 100 slots, twenty-three slots are dedicated to BCH employees and another ten slots are for neighborhood families who are not employees of BUMC institutions.

2.7.5 OTHER BENEFITS

Parking

The University Associates project includes the addition and consolidation of parking for the medical area. In addition, the proponent is formalizing a Transportation Management Association with the medical institutions in the area for more efficient management and service to employees and patients for parking and all modes of transportation.

Revitalization

The University Associates project offers revitalization through the creation of positive activities at an underutilized site. The project will serve to:

- Replace deteriorating medical facilities and expand medical services

- Enhance Albany Street pedestrian experience with new activities and improve safety
- Provide new open space
- Create positive views into the South End and screen unattractive highways from the South End

Job Creation

Phase I of the University Associates project will host approximately 800 permanent jobs with the completed project creating about 2,275 permanent jobs. Over the life of the project, approximately 2,600 construction jobs are anticipated to be generated.

2.8 TIMETABLE, PHASING, COSTS

The total project is estimated to cost $300 million. The project is planned in two phases. Phase I includes Building 1, parking garage, Building 2, biomedical research center, Building 3, medical office, substantial portions of the pedestrian plaza and landscaping plan, infrastructure and road improvements to the site and garage. Phase II includes construction of Buildings 4 and 5, research/office, and Building 6, hotel, completion of the pedestrian plaza and open space plan, remaining road and infrastructure improvements, relocation of the helipad, and the balance of the parking facilities.

Phase I construction is planned to commence in the fall of 1991 and to be completed in 1994. Building 2 construction is anticipated to begin in the last quarter of 1991 and be completed by the end of 1993. Building 1 construction will commence by the 2nd quarter of 1992 and be completed in the 1st quarter of 1994. Building 3 is planned to be constructed between the 4th quarter of 1992 and the 4th quarter of 1994.

Construction of Phase II is expected to begin in 1996 and to be completed by the Year 2000.

3.0 SHADOW STUDY

3.0 SHADOW STUDY

3.1 INTRODUCTION

The site master plan has endeavored to achieve desired program goals, meet zoning requirements, and address a variety of design and environmental issues. When developing a vacant site the creation of new shadows is unavoidable. The shadow impact study was performed to illustrate and evaluate the shadows cast by the University Associates project at full build. The greatest attention is given to pedestrian areas and open spaces at the street level. The overall off-site impacts are minimal and sensitive receptors, such as the daycare center, are not adversely impacted.

3.2 METHODOLOGY

The shadow study shows the University Associates site plan at 9:00 AM, Noon, and 3:00 PM for the vernal equinox (March 21st), summer solstice (June 22nd), autumnal equinox (September 23rd), and the winter solstice (December 22nd). The shadows were calculated based on the Time-Saver Standards for Architectural Design Data (John Hancock, McGraw-Hill) for Eastern Standard and Daylight Savings Time conditions.

Exhibits 3 - 1 through 3- 12 illustrate the shadows cast by existing buildings in black and the shadows created by the University Associates project in gray.

3.3 RESULTS

The daycare center play area and open space along the Massachusetts Avenue Connector will be free of shadows from the project buildings. Some shadows are cast for short periods of time along Albany Street and on the pedestrian plaza.

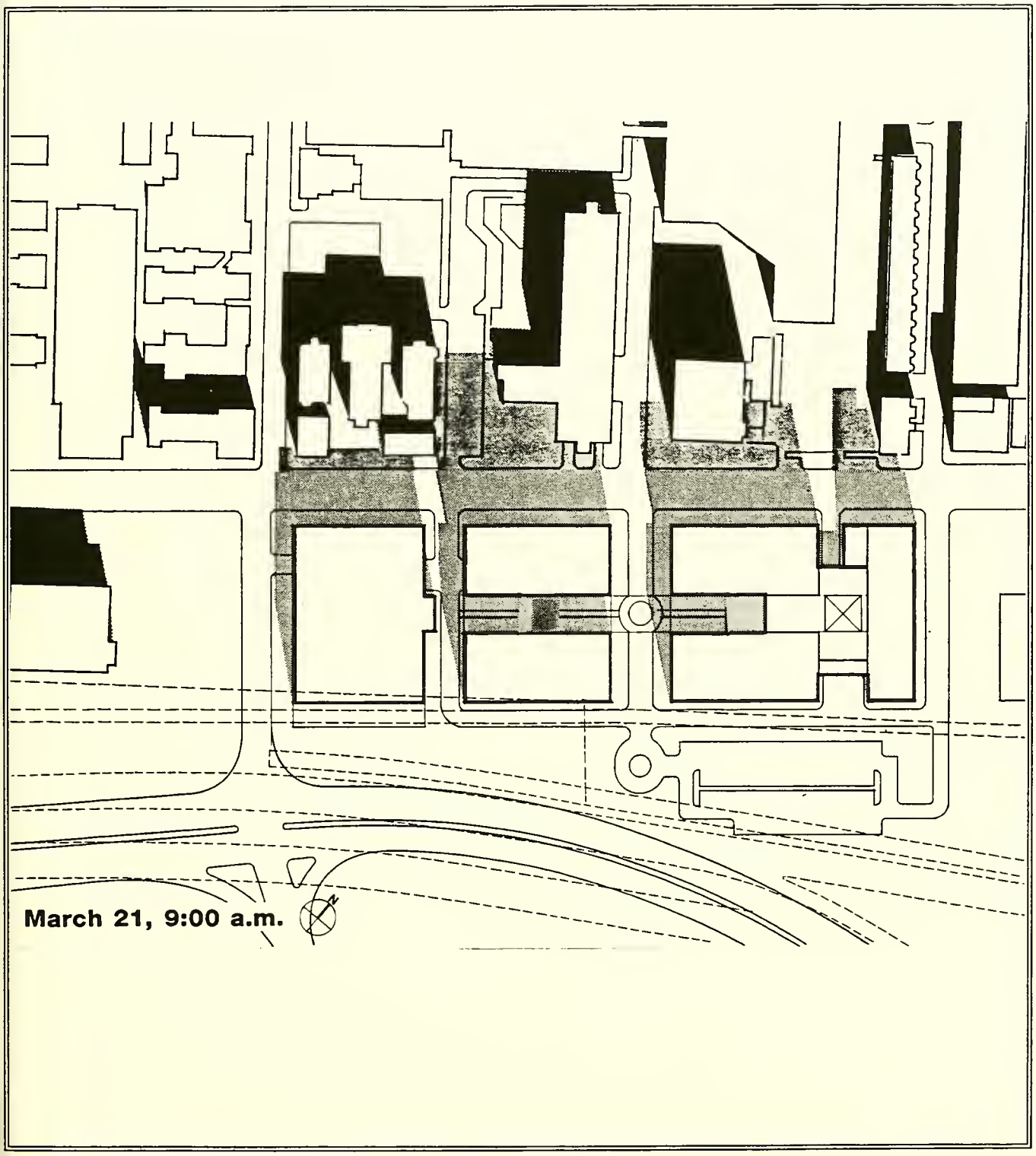
The worst shadow conditions are experienced in the Winter season when long shadows are caused by all buildings in the area, limited to the Winter morning hours. This morning condition affects Albany Street and, to a limited degree, the backyard of nearby residences on East Brookline Street.

Spring and Fall conditions cause some shadows across Albany Street and on University Hospital in the morning and on the project's pedestrian plaza in the afternoon. No new shadows are cast in the residential area.

Summer conditions produce less impacts relative to the other seasons, causing only minimal shadows across Albany Street and the project's pedestrian plaza.

3.4 MITIGATION

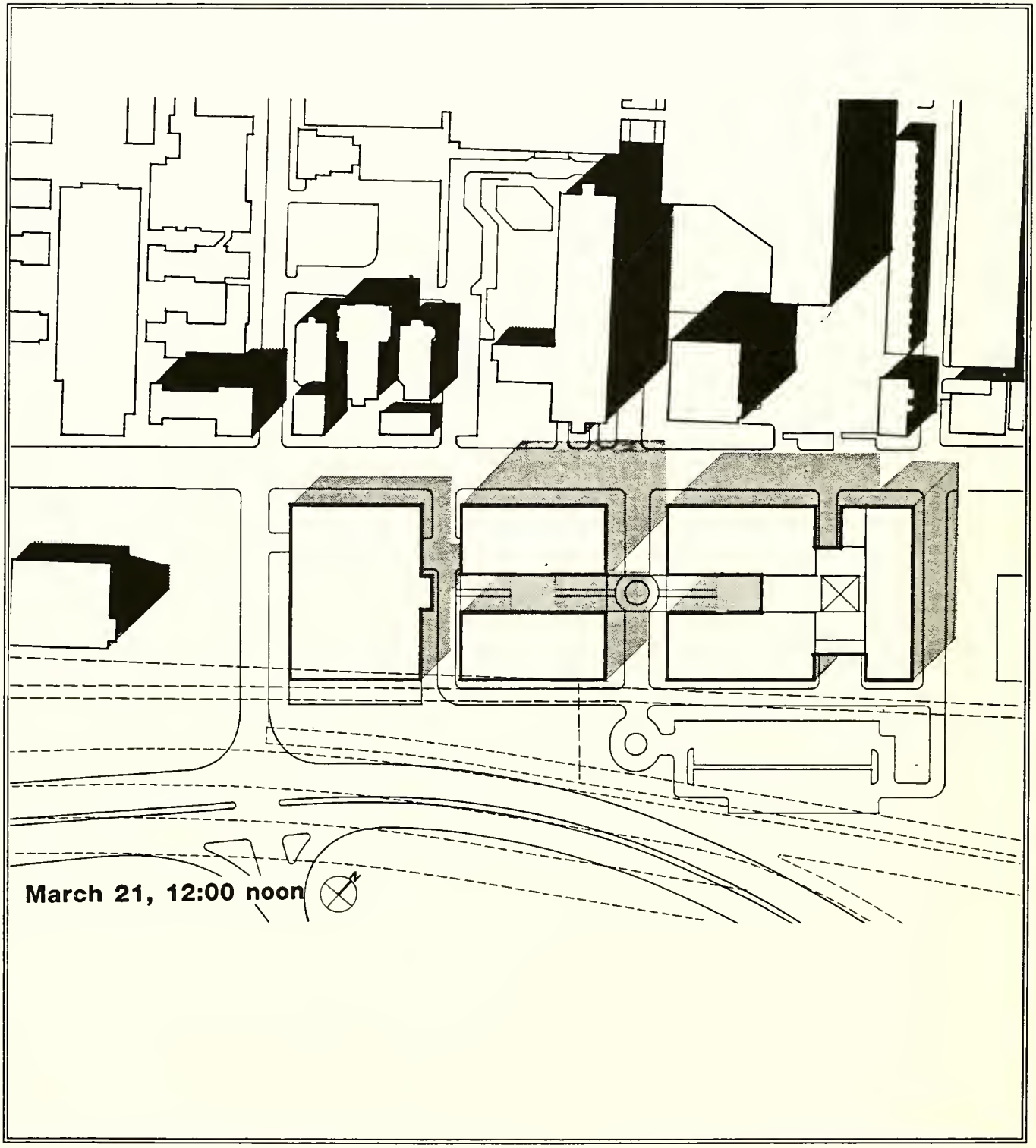
Additional site planning, which has resulted in modifications to the pedestrian plaza, has been conducted since the submittal of the DPIR. The buildings have been sited farther apart allowing for a wider plaza. This will provide some relief to shadow impacts in the pedestrian plaza and provide a higher quality open space experience. After construction of the project, the pedestrian level environment will experience very little qualitative difference compared to the existing environment. The daycare center will experience no adverse shadow impacts from construction of the other buildings.



Shadow March 21 9:00 AM

Prepared By:
Cambridge Seven Associates, Inc.

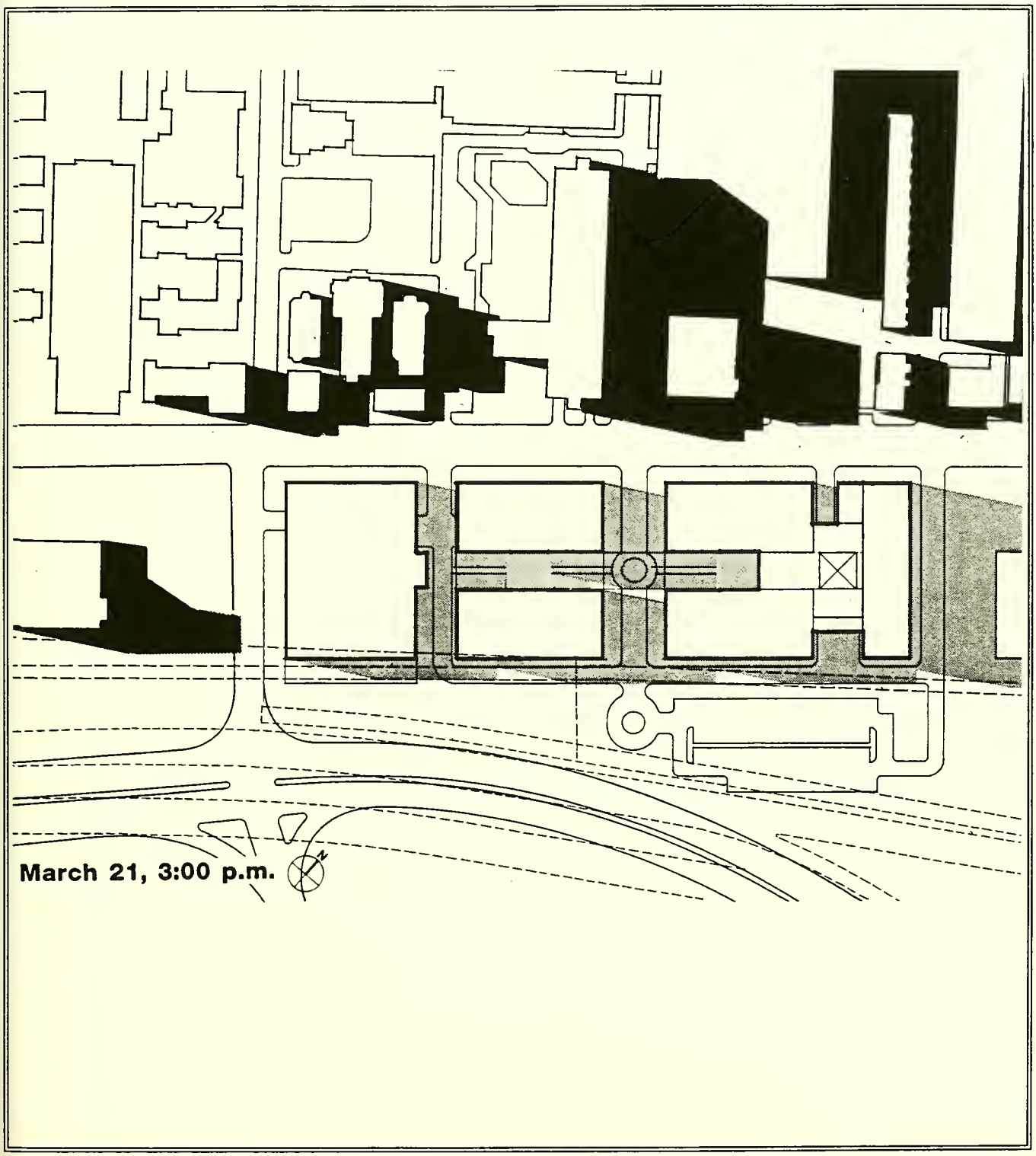
Exhibit 3 - 1



Shadow March 21 Noon

Prepared By:
Cambridge Seven Associates, Inc.

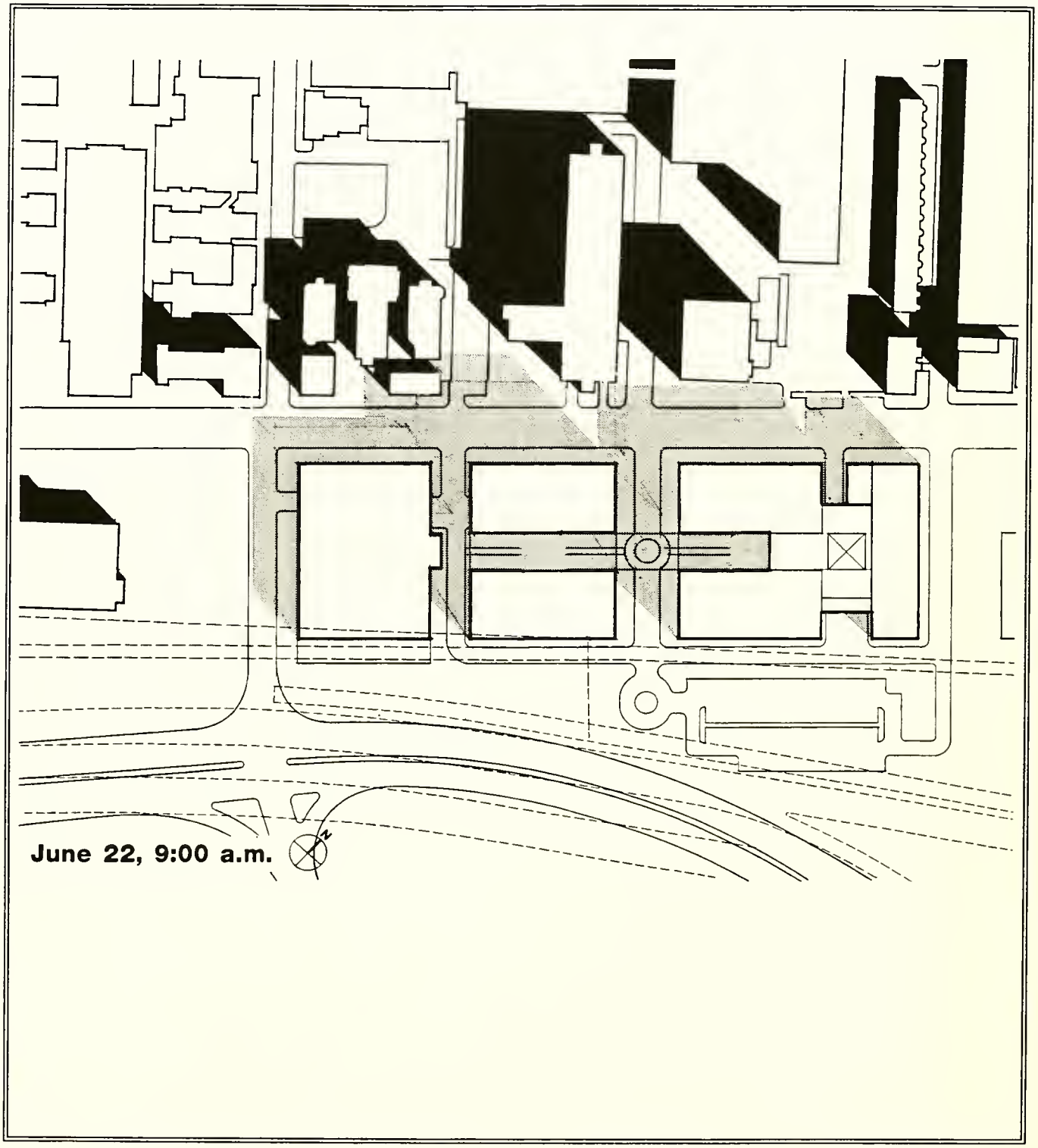
Exhibit 3 - 2



Shadow March 21 3:00 PM

Prepared By:
Cambridge Seven Associates, Inc.

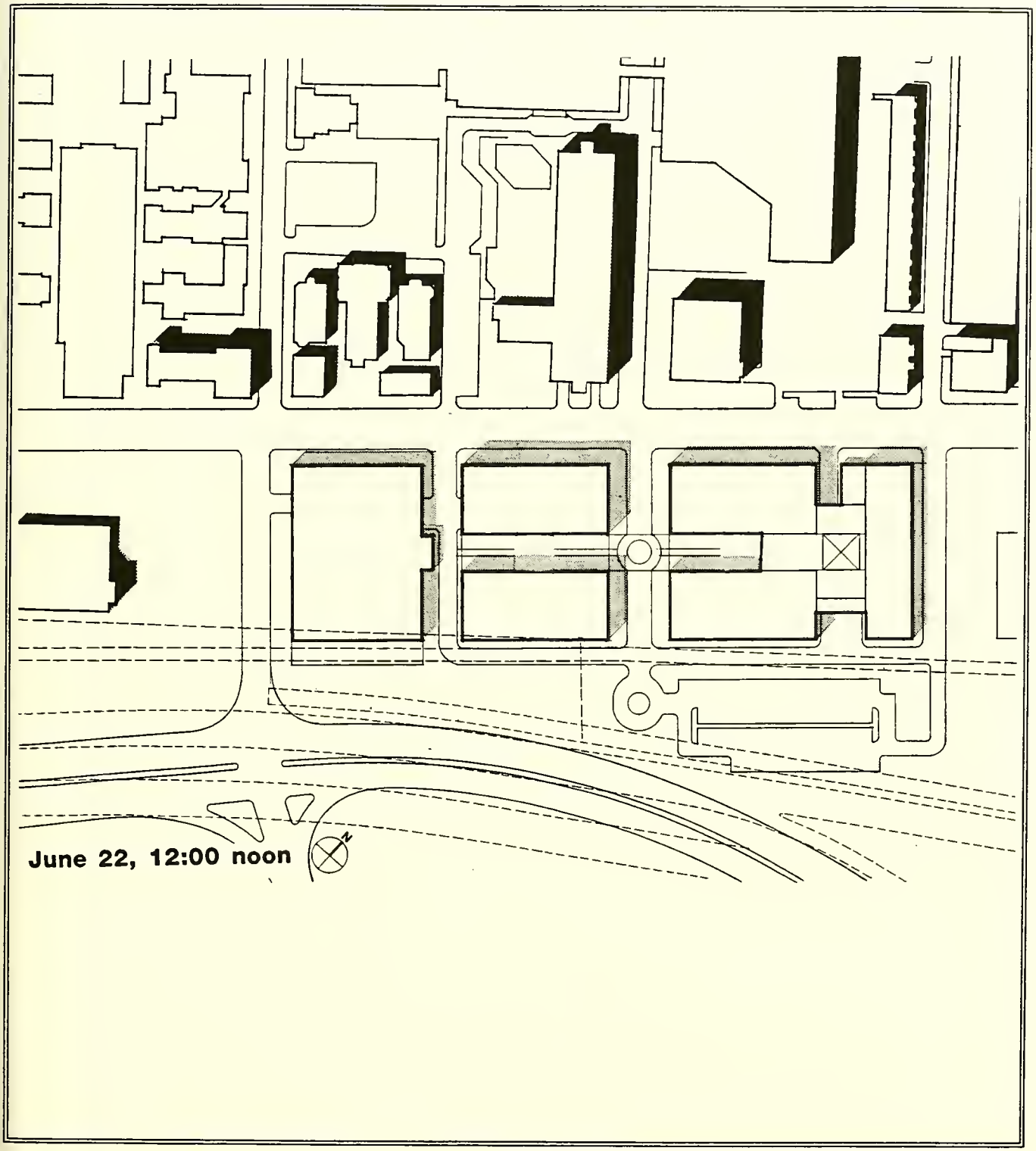
Exhibit 3 - 3



Shadow June 22 9:00 AM

Prepared By:
Cambridge Seven Associates, Inc.

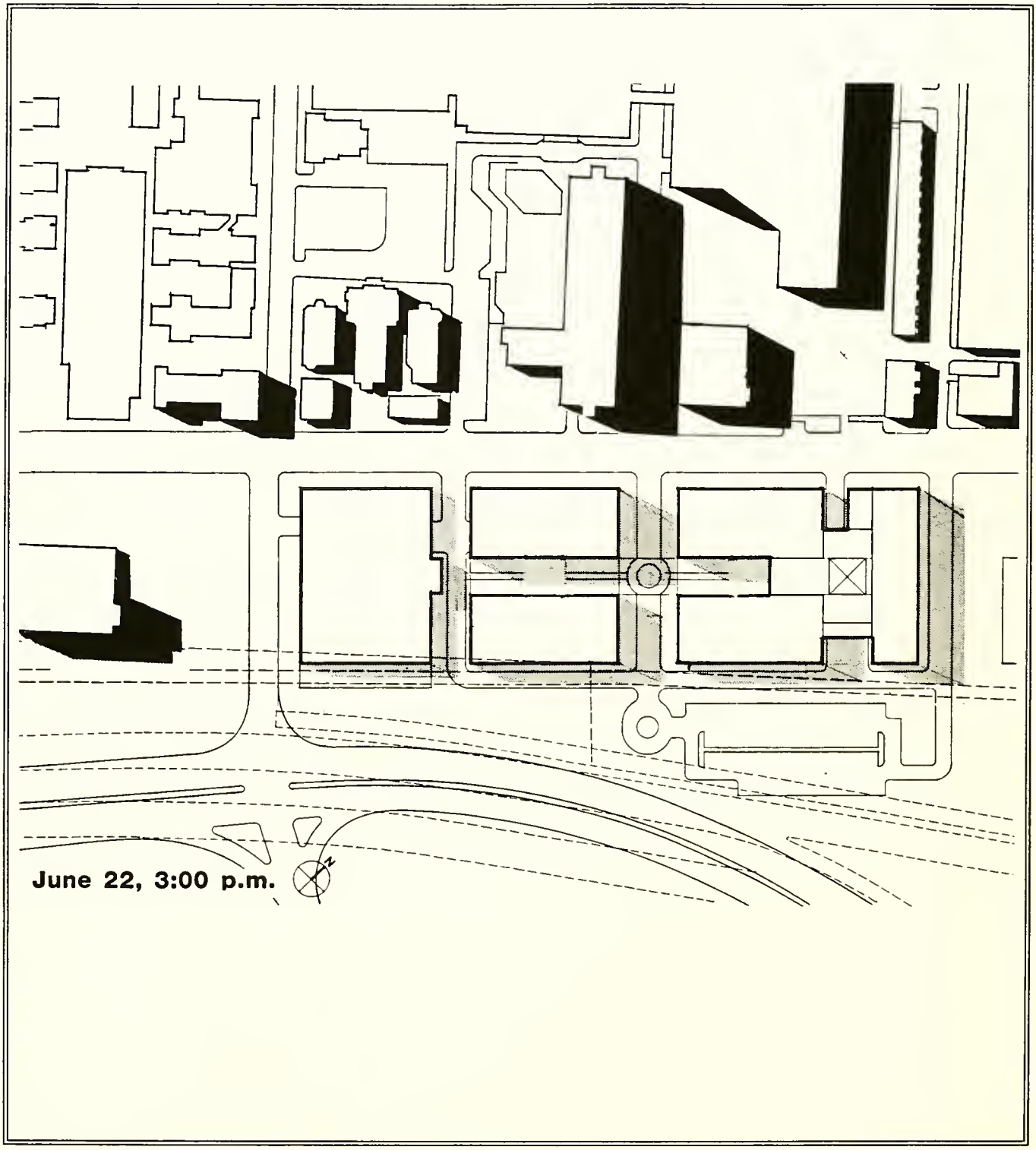
Exhibit 3 - 4



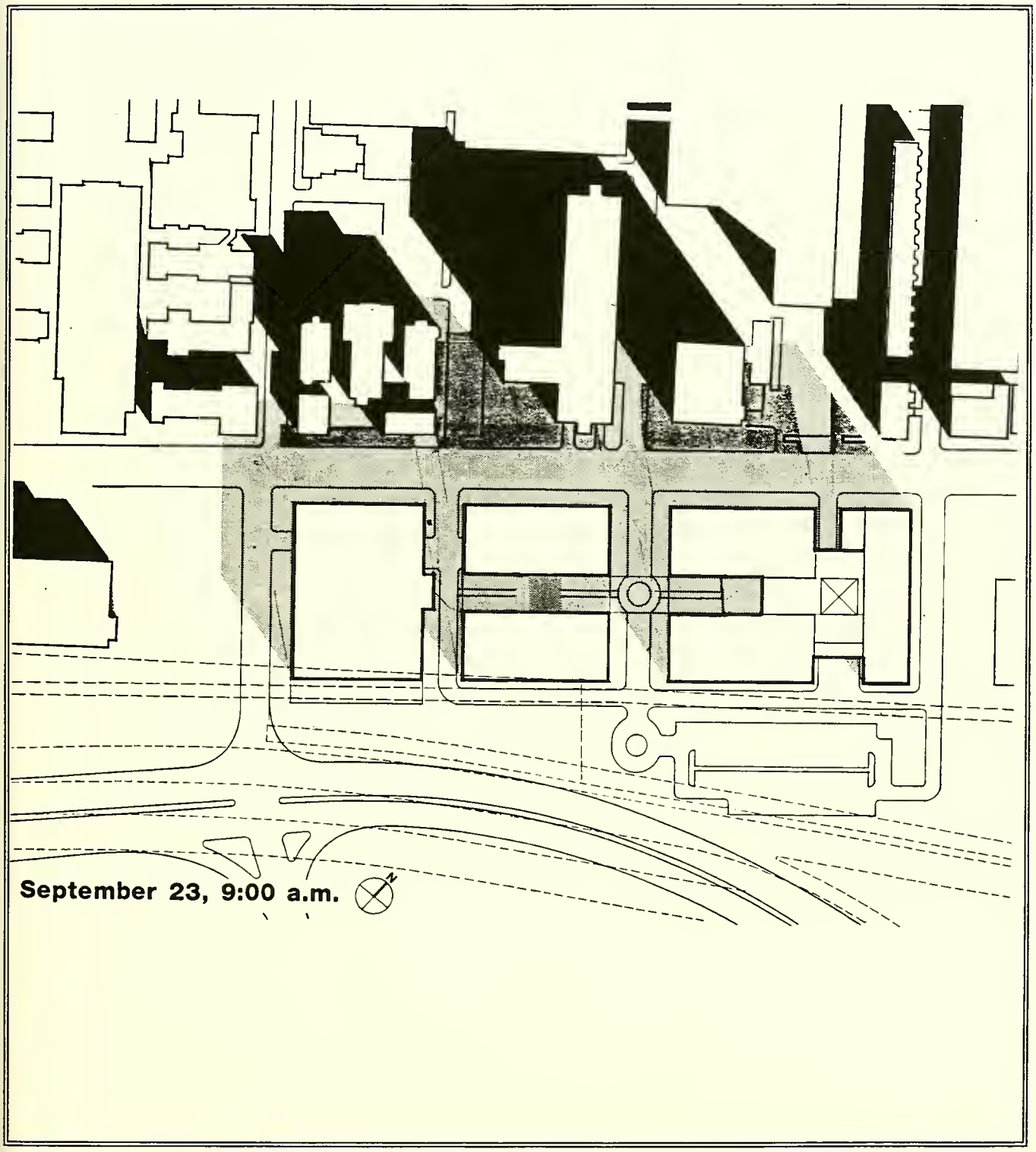
Shadow June 22 Noon

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 3 - 5



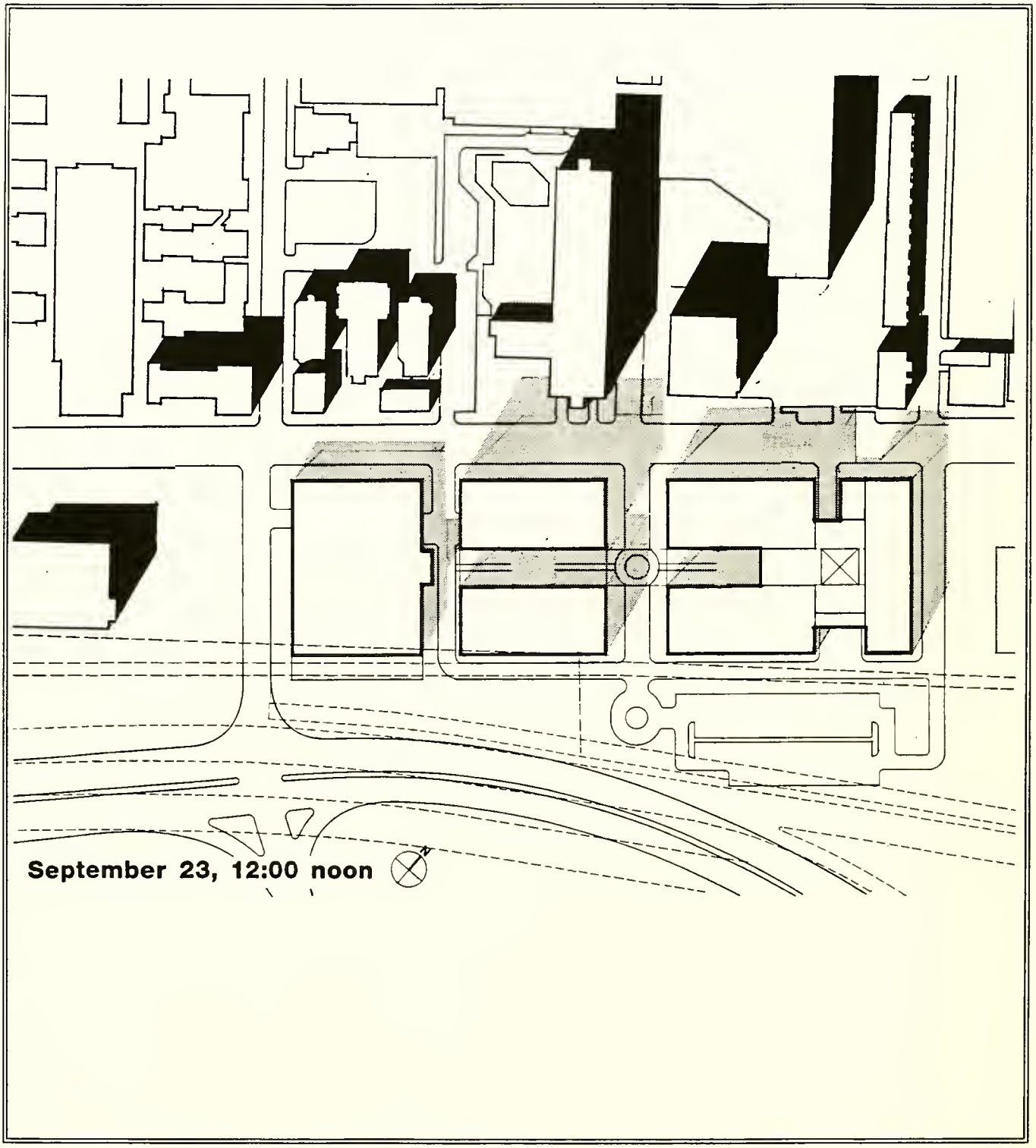
Shadow June 22 3:00 PM	
Prepared By: Cambridge Seven Associates, Inc.	**Exhibit 3 - 6**



Shadow September 23 9:00 AM

Prepared By:
Cambridge Seven Associates, Inc.

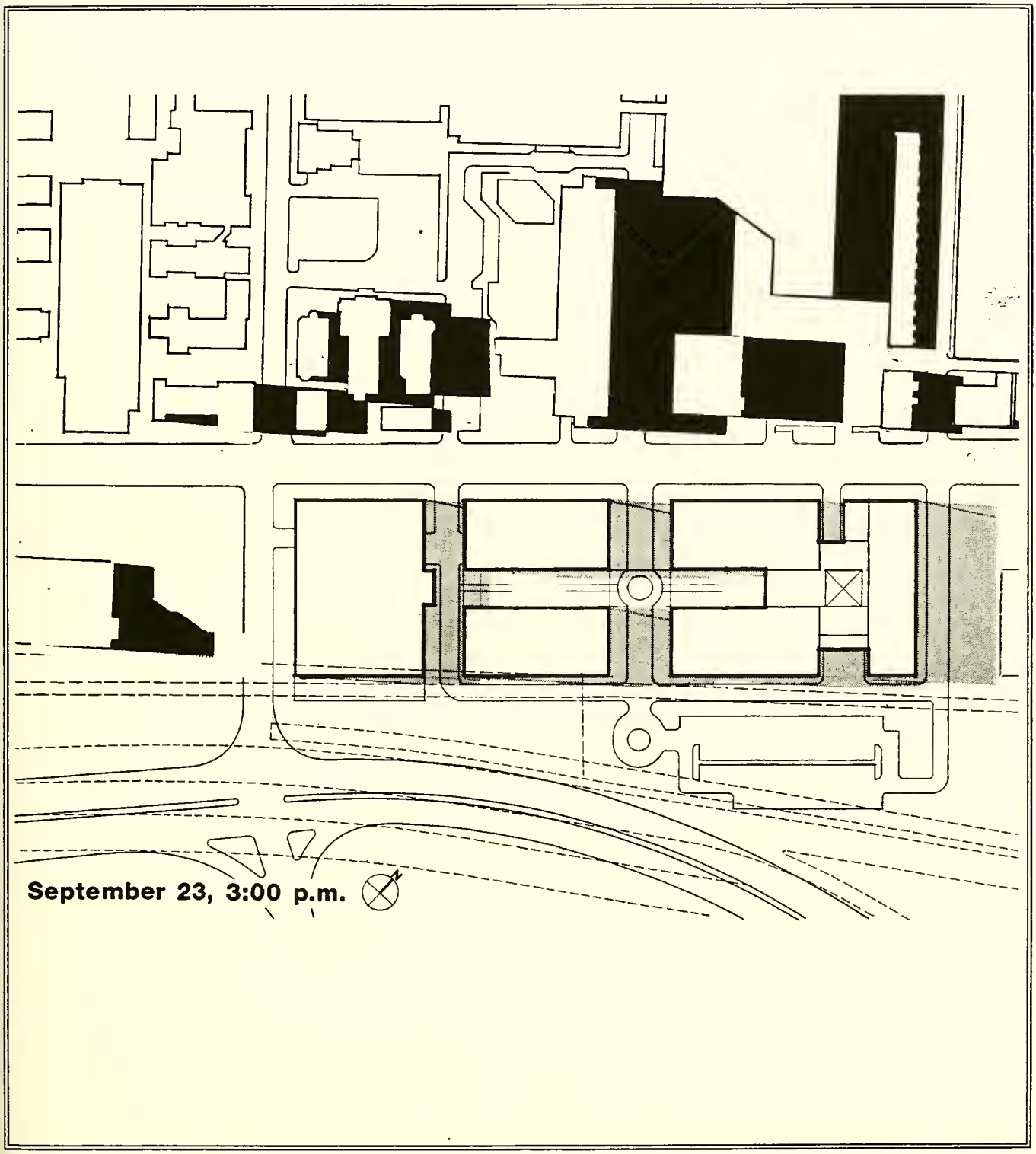
Exhibit 3 - 7



Shadow September 23 Noon

Prepared By:
Cambridge Seven Associates, Inc.

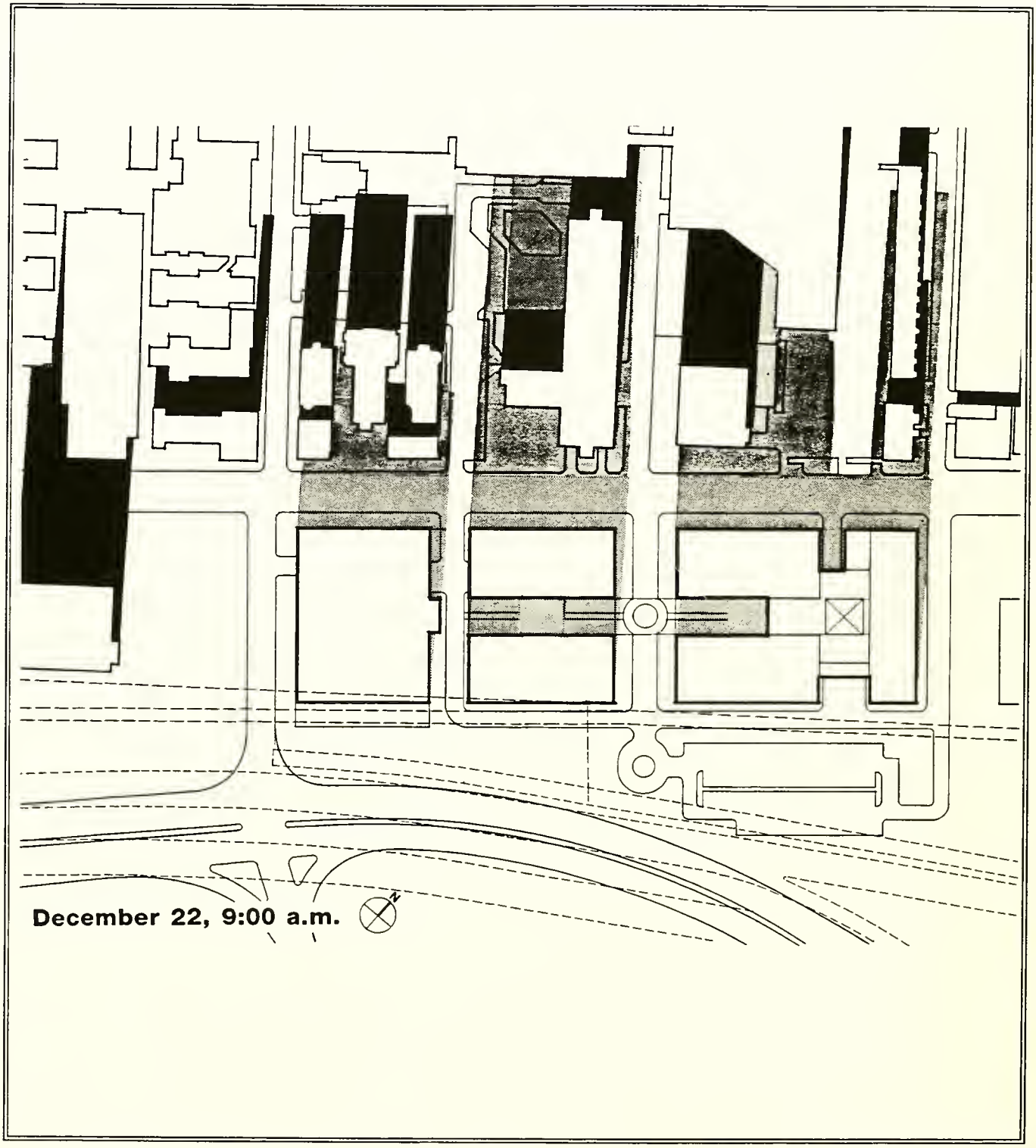
Exhibit 3 - 8



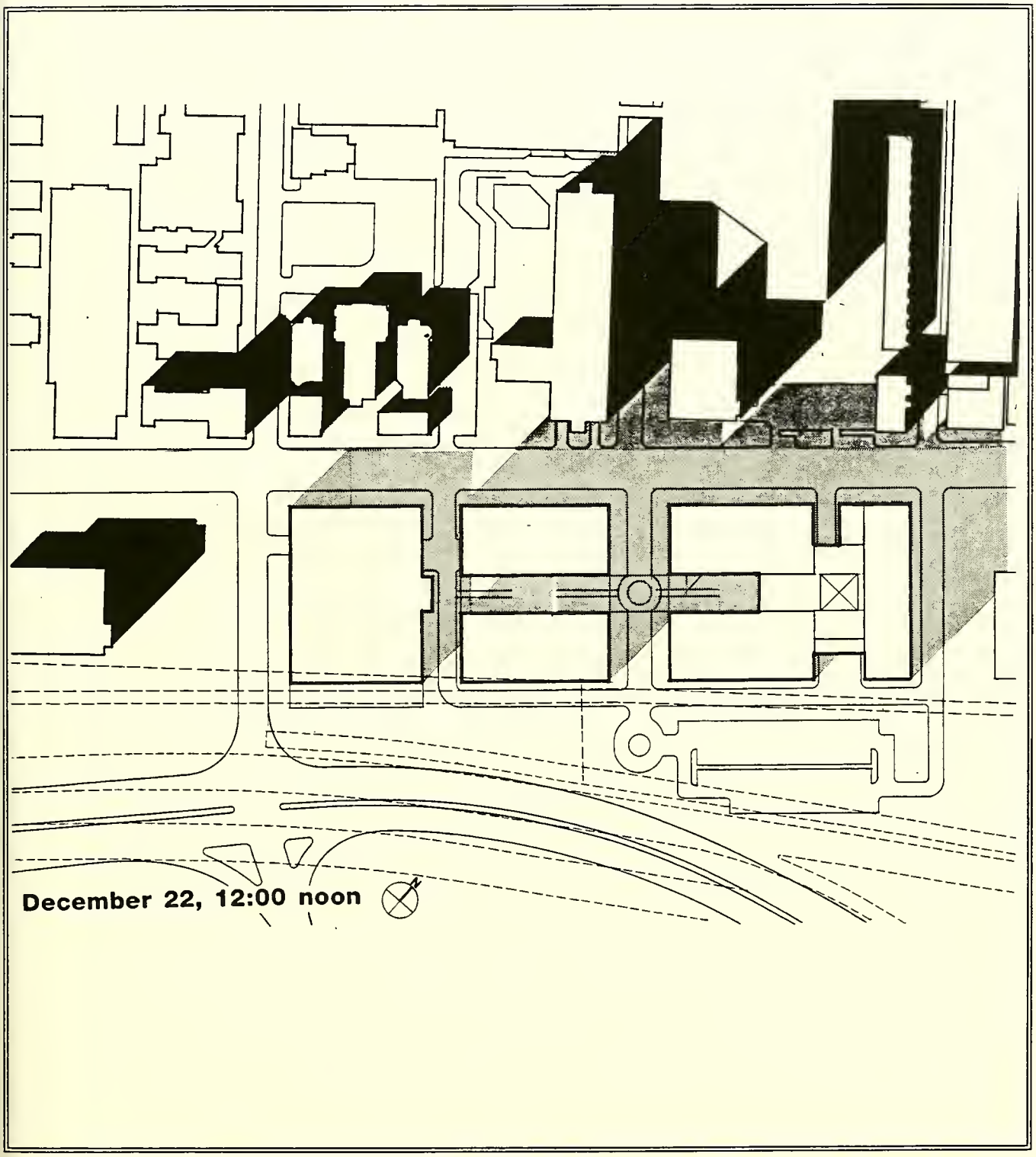
Shadow September 23 3:00 PM

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 3 - 9



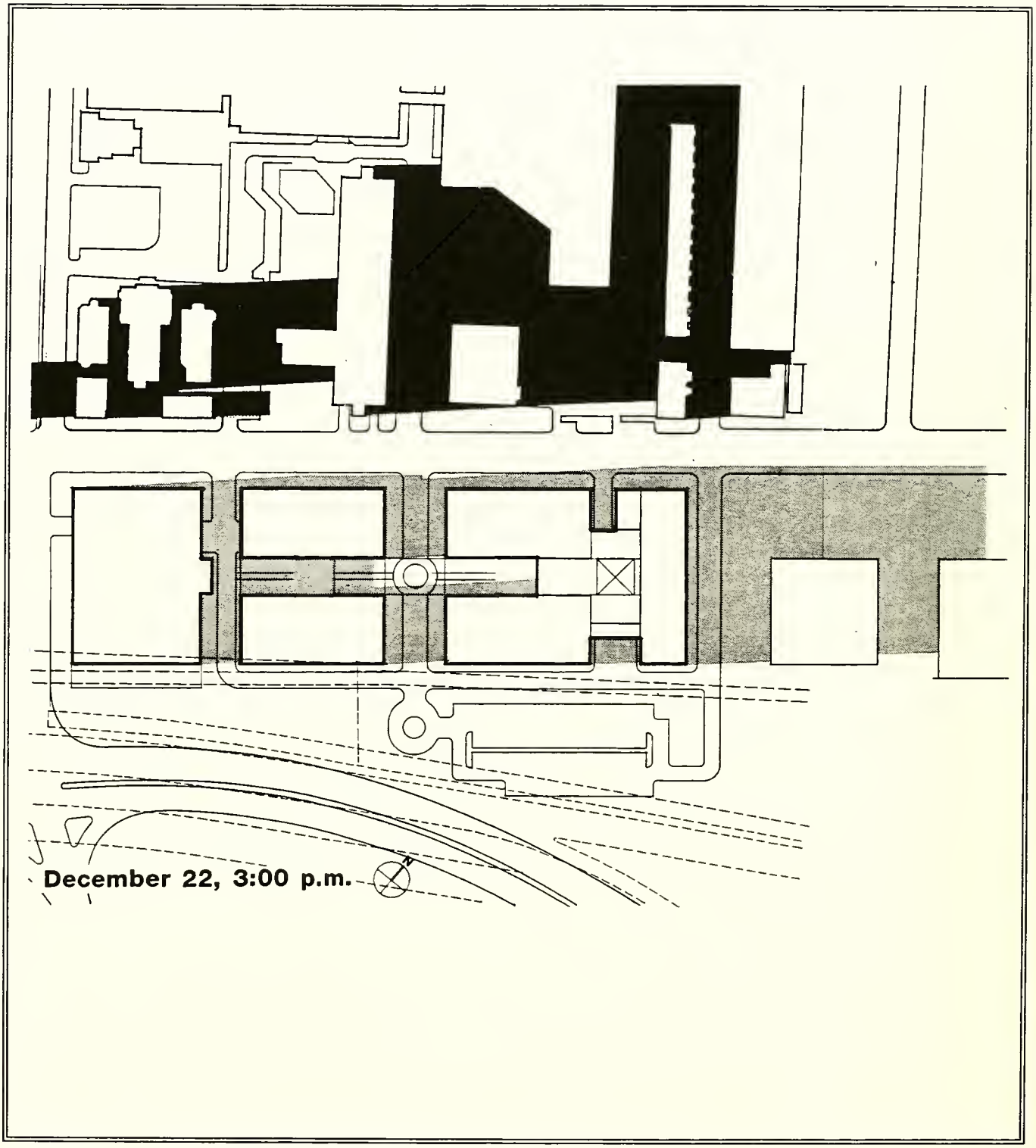
Shadow December 22 9:00 AM	
Prepared By: Cambridge Seven Associates, Inc.	**Exhibit 3 - 10**



Shadow December 22 Noon

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 3 - 11



Shadow December 22 3:00 PM	
Prepared By: Cambridge Seven Associates, Inc.	**Exhibit 3 - 12**

4.0 HISTORIC RESOURCES

4.0 HISTORIC RESOURCES

4.1 INTRODUCTION

This section provides summary information on the history of the project site, surrounding cultural resources, and the potential effects of the proposed University Associates project on these resources. A detailed report is provided in Appendix E, Historical/Archaeological Report.

The proposed project is consistent with both the historic setting of the South End and with its specific architectural characteristics. That opinion is based on two principal considerations. First, the site plan and massing of the proposed project will help to mend the irregular urban edge that now exists along Albany Street. By developing this underutilized lot, the proposed project helps give definition to the southern edge of the South End while screening the major negative effect of the Massachusetts Avenue Connector/Southeast Expressway. Second, the architectural design of the proposed project is informed by the scale, massing, materials, and architectural detail of neighboring South End institutional buildings, and by the street plan of the district. The proposed project goes well beyond the South End Harrison/Albany Protection Area Guidelines to respect the historic and architectural character of the South End.

The proponent filed an application for Certificate of Appropriateness-or-Design Approval-or-Exemption on September 19, 1991. The South End Landmarks District Commission issued a Certificate of Design Approval for the University Associates project on October 1, 1991. (The Certificate is included in Appendix D, Approvals and Agreements.)

4.2 SITE HISTORY

Most of the South End was created through massive landfill operations in the period 1800-1870 (Landmark Report 1983: 6). The proposed project site, originally part of South Bay, was created in the early 1850s, with a narrow waterway known as the Roxbury Canal paralleling its southern edge. A mooring slip at the eastern edge of the site ran north from the Roxbury Canal toward Albany Street. The mooring slip was partially filled c.1936. The Roxbury Canal was buried between 1957 and 1976. (Haley & Aldrich 1986: 2) See Exhibit 4 - 1.

The site has been owned and used by various subdivisions of the City of Boston including the City Stable, the Public Works Department, and the Water & Sewer

Department. Between 1860 and 1977, these agencies erected numerous small-scale, wood-frame and masonry buildings. The most substantial of these was the City Stable laid out in a "U" configuration, located near the center of the site. The majority of these buildings was razed in 1977 to create the present surface parking lot. (Haley & Aldrich 1986) See Exhibits 4 - 2 and 4 - 3.

4.3 EXISTING CONDITIONS DESCRIPTION

The University Associates project is located near the southwest corner of the South End in an area that historically has been devoted to institutional/medical uses. The site abuts the South End National Register District and the South End Landmark District, and is within the South End Harrison Avenue/Albany Street Protection Area. The site is currently devoid of buildings and used for surface parking. The overall character of the surrounding area is extremely varied. The following section cites specific structures which are keyed by number to the site plan in Exhibit 4 - 4.

The southern edge of the parcel is bounded by the Massachusetts Avenue Connector, a major elevated highway corridor that sweeps down from the Southeast Expressway (E) to ground level behind the site (#1). This piece of modern transportation engineering is the antithesis to the pleasant residential streets and squares that define the South End District.

The approximately eight-story modernistic Boston City Hospital (BCH) Power Plant stands west of the site (#2). It is set well back from Albany Street, and is surrounded by a paved parking lot. Similarly, the one-story warehouse to the east is a blocky, modern structure surrounded by an asphalt parking lot (#3).

The north side of Albany Street, opposite the proposed project site, is devoted to institutional/medical uses. The buildings opposite the central and eastern portions of the site, centered on East Newton and East Brookline Streets, are modern mid- to high-rise medical facilities ranging in height from approximately seven to fourteen stories. The only exception is an undistinguished brick, four-story plus, mansard building (#10) at the northwest corner of East Brookline Street.

The buildings at the west end of Albany Street, centered on East Concord Street, are late 19th and early 20th century medical facilities. The northwest corner of Albany and East Concord Streets is part of the Boston City Hospital (BCH) Campus (# 4-6). That campus is now dominated by multi-story, turn-of-the-century, red brick buildings with Beaux-Arts style details. The northeast corner of Albany and East Concord Streets is occupied by the former Homeopathic Hospital of 1876-84 (# 7-9). This handsome Victorian Gothic style building is oriented toward the

South End and with its back facing Albany Street. Little of its historic/architectural character is apparent from Albany Street and the proposed project site.
The view corridors along East Concord and East Newton Streets are partially blocked by overhead pedestrian bridges.

4.4 CULTURAL RESOURCES IN THE PROPOSED PROJECT VICINITY

The South End Historic District is the most important cultural resource in the proposed project vicinity, and the only one to be formally designated. It was listed in the National Register of Historic Places in May, 1973 and was designated as a Boston Landmark in November, 1983. Thus, it is included in the State Register of Historic Places. Exhibit 4 - 5 shows the South End Landmark District boundaries.

The South End Harrison Avenue/Albany Street Protection Area was designated by the Boston Landmarks Commission in November, 1983 "so as to maintain a transitional area adjacent to the Landmark District" (Landmark Report 1983: 32).

Petitions have been filed to designate Boston City Hospital buildings B, C, D, F, G and H as Boston Landmarks. No action has been taken by the Landmarks Commission on these petitions.

The Homeopathic Hospital is not the subject of any formal historic designation. However, the survey of Historical/Archaeological Resources undertaken for the Central Artery/Tunnel project, recommended it for individual listing in the National Register of Historic Places. No action has been taken on this recommendation.

According to Massachusetts Historical Commission files, there are no known or designated archaeological properties on the proposed project site.

4.5 ANALYSIS OF POTENTIAL EFFECTS

Potential effects to the South End District and its Protection Area are measured according to the Specific Standards and Criteria set forth by the Landmarks Report (Report 1983: 51).

Demolition: Most of the buildings that previously occupied this site were demolished in the 1970s. The site is currently vacant of structures; no demolition is necessary.

Land Coverage: A setback of 15 feet from Albany Street is proposed to provide a more generous sidewalk, and to balance both the width of the street and the height of the proposed buildings. The setback maximum of 10 feet from the back of the sidewalk line will not be exceeded.

Height of Structures: Six structures are proposed for the site, ranging in height from approximately 80 feet to 144 feet, with a 28 foot penthouse. The heights of the project are in compliance with the 150 foot maximum. Due only to the mechanical penthouse, the nine-story Medical Research Building (Building 2) is the only building to exceed the 150 foot height limit, and only when the penthouse is taken into account. The mechanical penthouse cannot be seen from the nearest public way in the Landmark District, Thorn Street, and therefore, is acceptable under the Protection Area Standards.

The Medical Research Building is sited on Albany Street opposite the ten-story Solomon Carter Fuller Mental Health Center. The Fuller Center and adjacent seven to fourteen story high rise buildings will effectively screen the proposed Medical Research Building from the Landmark District.

Topography: The site is nearly flat, resulting from mid-19th century landfill activities. No substantial change in topography is proposed.

Landscape: Landscape elements do not obstruct views from public ways of elements of the adjacent landmark district, nor is there any surface parking as stated in the Guidelines. Landscaping is designed to soften building, sidewalk, and parking area edges, and is confined to those areas. It should be noted that views of the adjacent Landmark District are partially blocked on East Concord and East Newton Streets by overhead pedestrian bridges. The proposed project will not further obstruct those views. The helicopter pad has been placed at the rear of the site adjacent to the Massachusetts Avenue Connector and away from the historic district, to minimize its impact on the South End District.

There are no public ways in the Protection Area to the south of the project. Massachusetts Avenue is the nearest public way to the west and Albany Street is the nearest public way to the north. None of the views of the Landmark District from these public ways will be obstructed by the project. Although the project does not include new public ways, the service roads and pedestrian plazas have been designed to maximize views to and from the South End.

Review processes required by the Massachusetts Historic Commission and/or the National Historic Preservation Act may apply to other cultural resources in the proposed project area.

Boston City Hospital, founded in 1861, occupies a location opposite the northwest corner of the proposed project site. Over the years, BCH was constantly expanded and rebuilt, so that the present campus represents a "second generation" hospital consisting largely of mid- and high-rise turn-of-the-century buildings. Two of the original 1861 buildings have survived, however, and are the subject of a Landmark petition. They occupy an interior position in the campus, and are totally screened from the proposed project by their later and taller neighbors.

The former Homeopathic Hospital is located opposite the northwest portion of the proposed project site. This building is oriented toward the South End with its back toward Albany Street. Typically, the rear elevation (S), which faces Albany Street and the proposed project site, is utilitarian in fenestration, detail, etc. Furthermore, it is separated from Albany Street by a concrete block wall, two one-story period outbuildings, and a large corrugated metal shed. Little of the historic architectural character of the building is apparent from Albany Street.

The proposed project Master Plan responds to the presence of these buildings by placing the lowest building (the 82' parking garage) in this area. It is unlikely that the proposed project will have any effect on the historic/architectural character of Boston City Hospital or the former Homeopathic Hospital.

It is unlikely that significant pre-historic or historic archaeological properties exist on the site, or will be affected by the project. Prior to the mid-19th century, the site was partially underwater, and was part of a tidal flat area. In the 1850s, the site was filled with gravel. From that time until the present, the site has undergone a constant process of intensive use including building, rebuilding and demolition. These uses are well documented in the historic record.

4.6 MITIGATION

This section addresses measures that will limit the project's negative effects---or provide positive effects--on historic resources.

Albany Street/Harrison Avenue Protection Area Guidelines

The project adheres to the guidelines as detailed in section 4.5 above. Conformance to these guidelines is a major mitigation measure which will limit any potential negative effects of new construction within the Protection Area. The South End Landmarks District Commission has reviewed and approved the project.

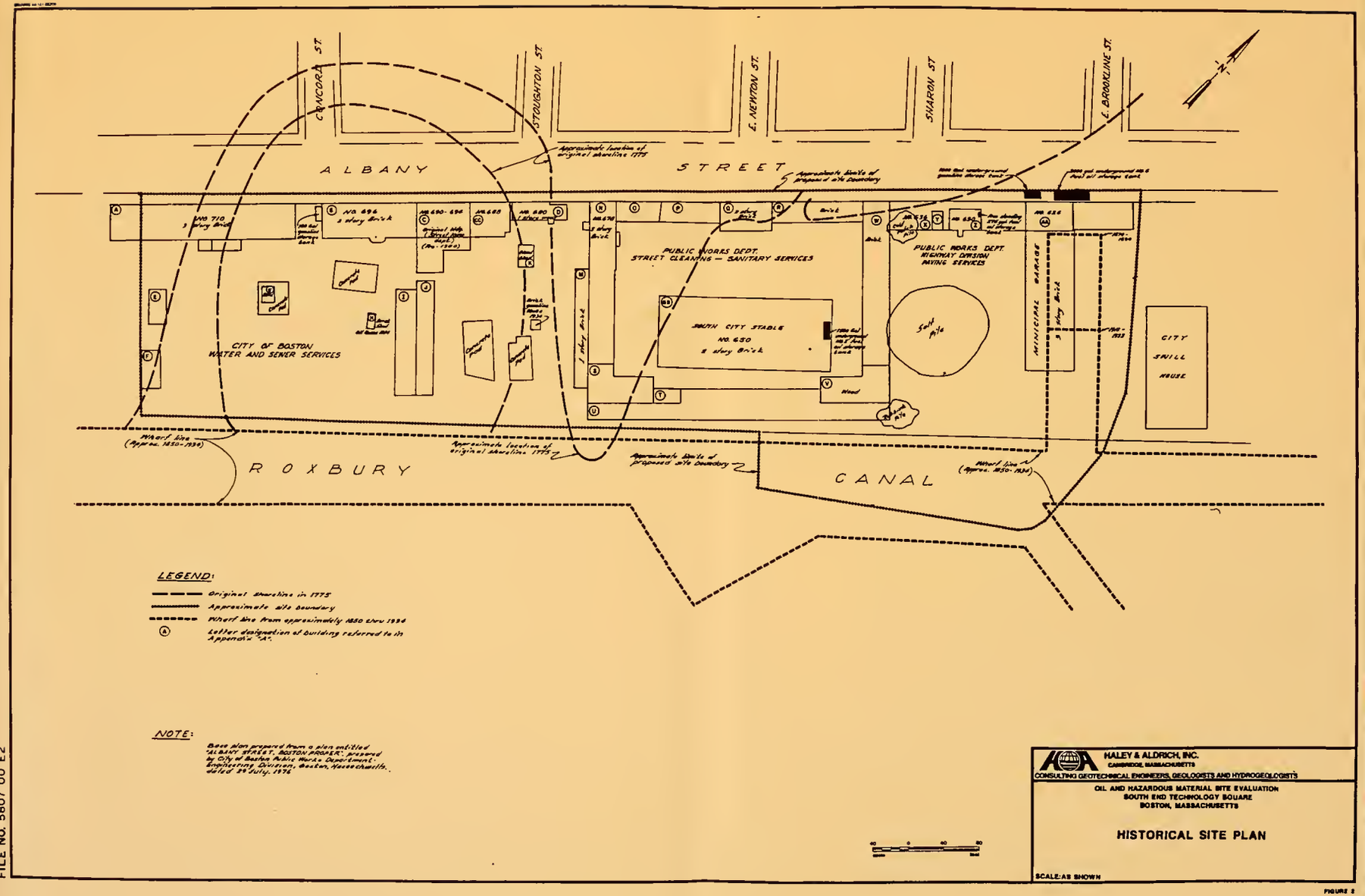
Master Plan Design Objectives

The stated design objectives of the project go well beyond the issues of height and setback governed by the Protection Area guidelines, to further enhance the effect of the proposed project on the adjacent South End District.

The proposed project gives definition to the southeastern edge of the South End District by re-establishing a building presence. This compatibly scaled group of buildings will act as a buffer and improve the view from the South End toward the Massachusetts Avenue Connector/Southeast Expressway.

The site plan reinforces street definition by extending existing streets through the site, and by aligning the buildings with the existing South End street system.

The Facade Guidelines presented in this report (Section 2.0 Detailed Project Description) are informed by existing turn-of-the-century institutional and warehouse buildings in the immediate project area. See Exhibit 4 - 6. These are an appropriate historic design source because this corner of the South End has served institutional purposes since the land was created in the mid-19th century. The scale of these buildings also serves as an appropriate model for the proposed new construction.



FILE NO. 5807 00 E2

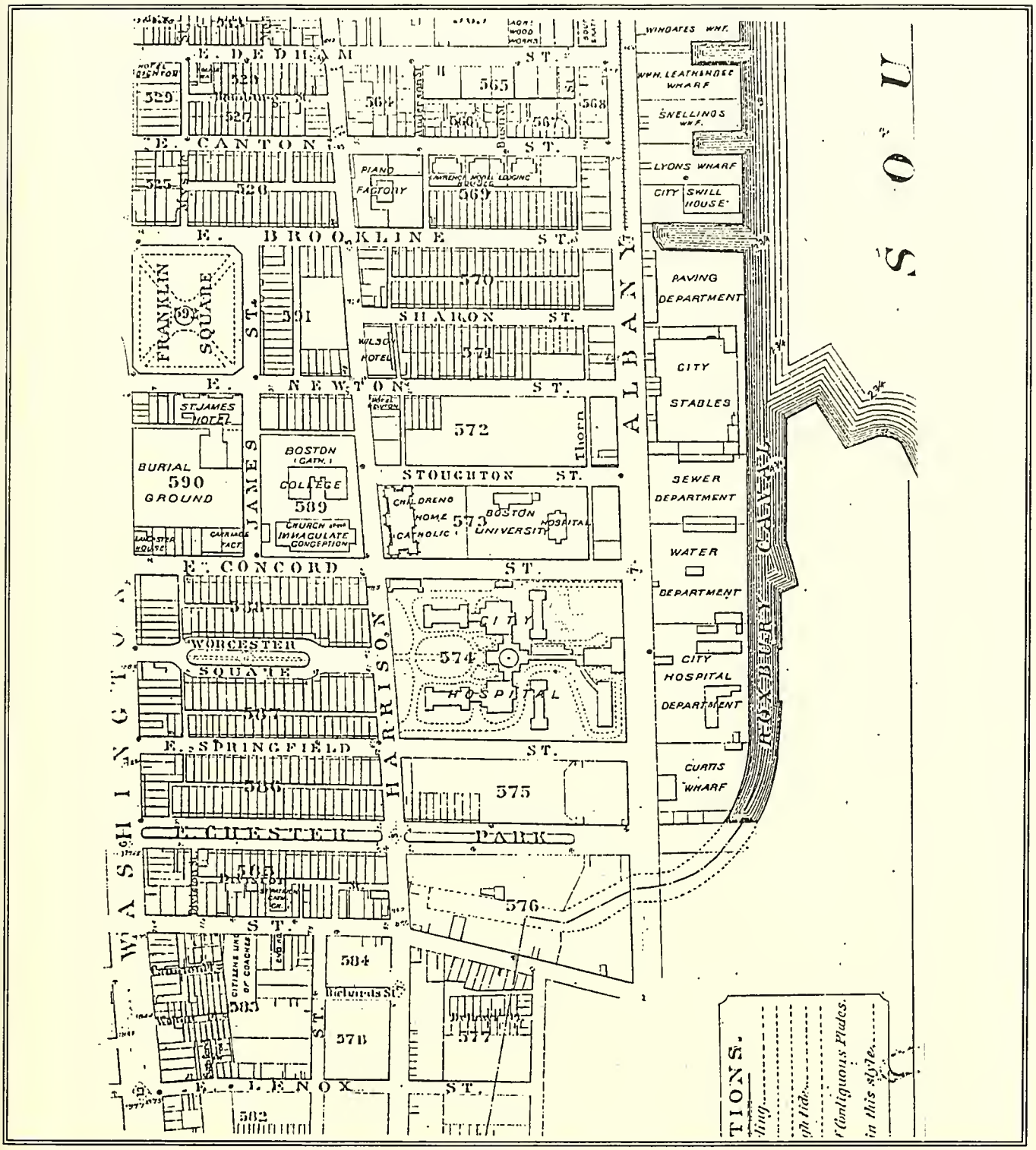
UNIVERSITY ASSOCIATES

Historical Site Plan

Exhibit 4-1

Prepared by:
Haley & Aldrich, Inc.

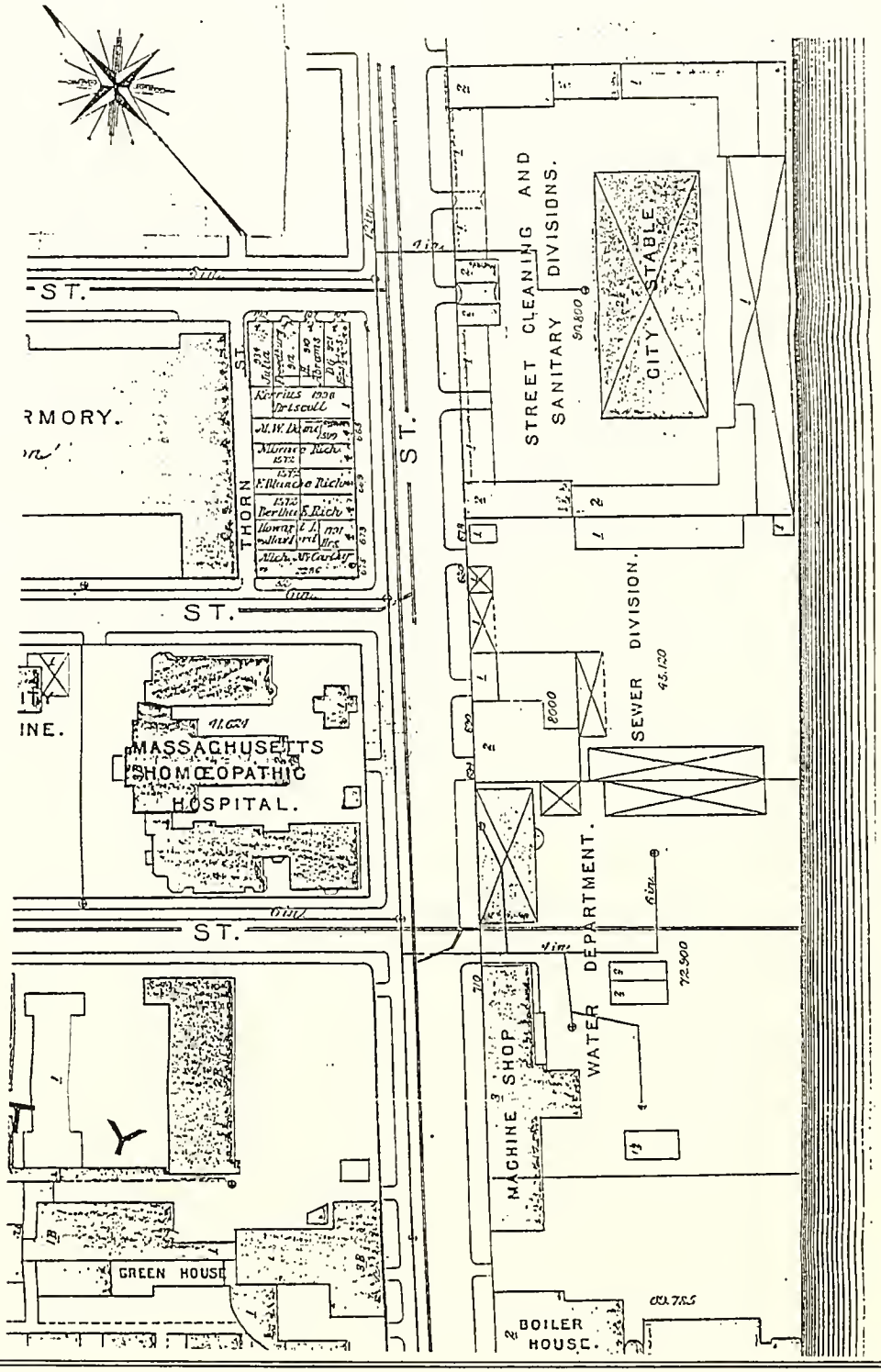
NOVEMBER 1991



1882 Boston Atlas

Prepared By:
Candace Jenkins

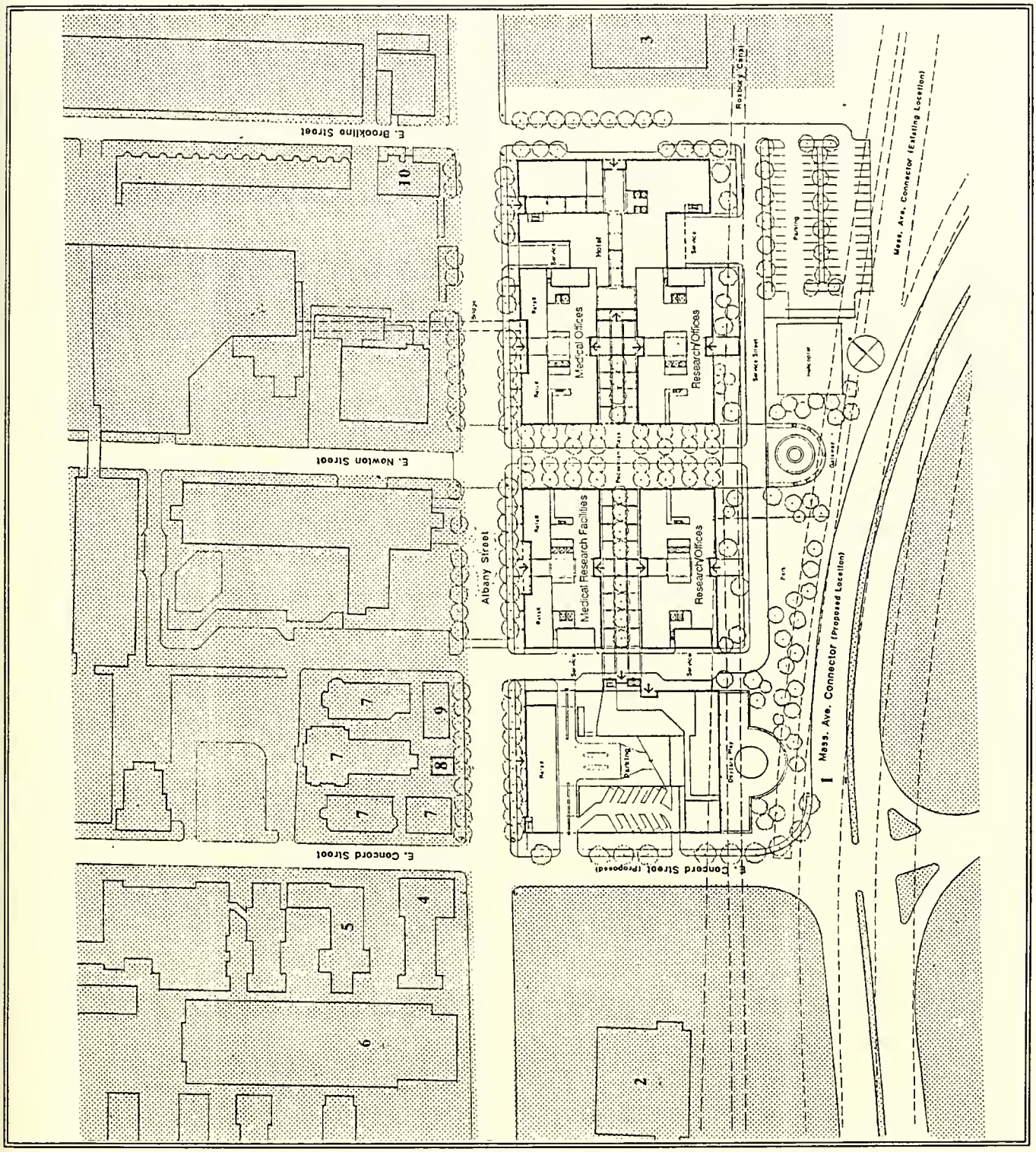
Exhibit 4 - 2



1902 Boston Atlas

Prepared By:
Candace Jenkins

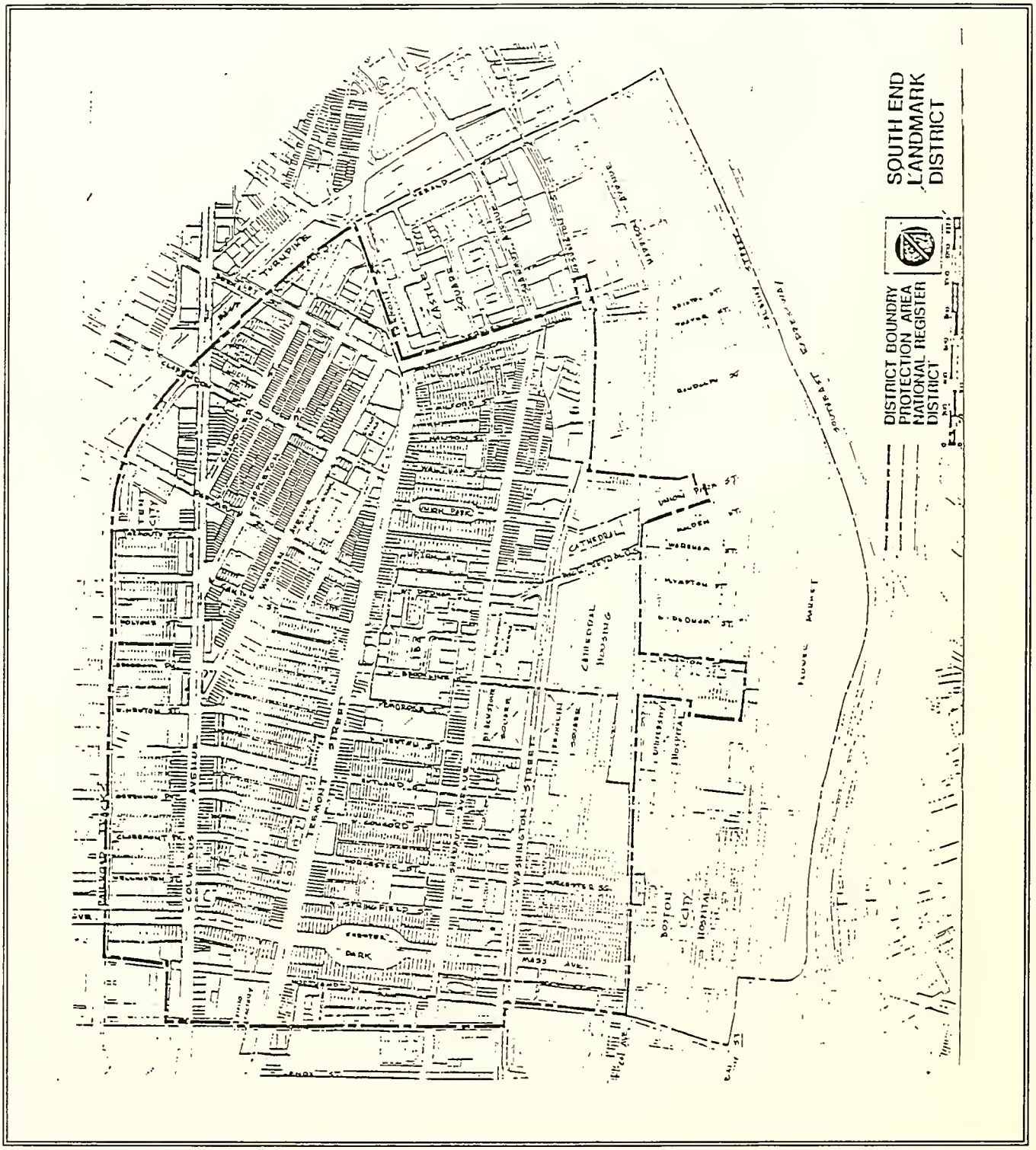
Exhibit 4 - 3



Project Site Plan and Vicinity

Prepared By:
Cambridge Seven Associates, Inc.

Exhibit 4 - 4

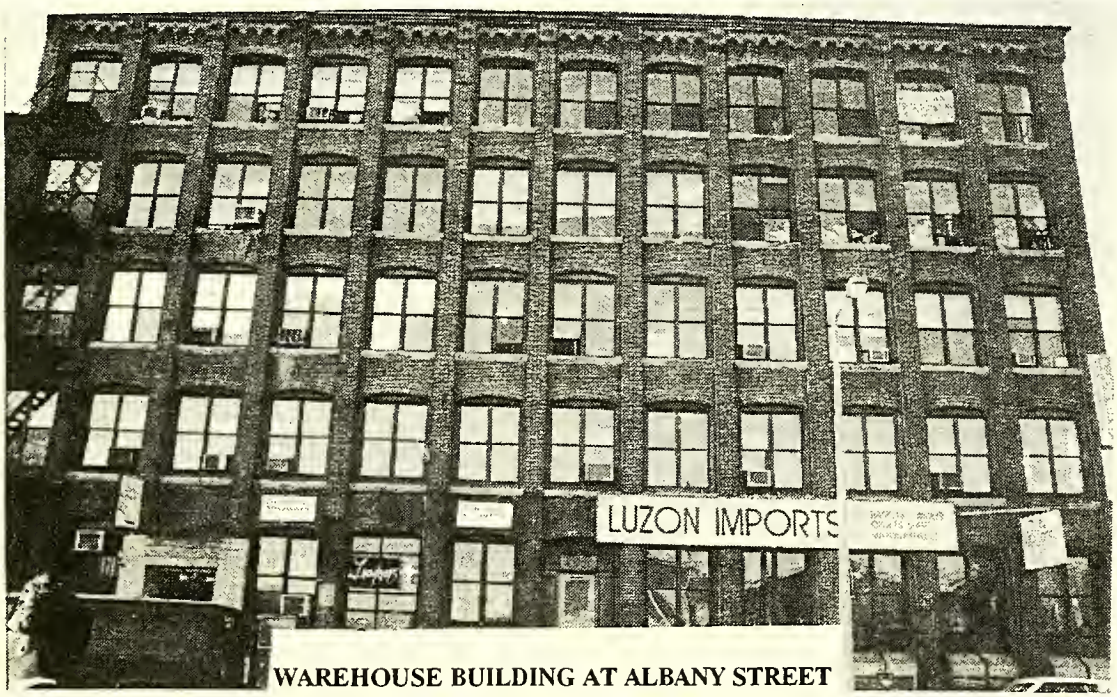


South End Landmark District

Prepared By:
Candace Jenkins

Exhibit 4 - 5

WAREHOUSE BUILDING AT ALBANY STREET



WAREHOUSE BUILDING AT ALBANY STREET

Existing Historic Buildings

Prepared by:
Cambridge Seven Associates, Inc.

Exhibit 4 - 6

5.0 WIND ANALYSIS

5.0 WIND ANALYSIS

5.1 INTRODUCTION

A pedestrian-level wind study was conducted for the University Associates project. The objectives of this study were to:

1) Quantitatively assess the effect that the University Associates Project would have on existing and future pedestrian-level wind conditions;

2) Compare the predicted wind conditions with criteria outlined by the Boston Redevelopment Authority (BRA); and

3) Develop mitigation measures for identified problem areas, if necessary.

The study is based on a 1:400 scale model of the proposed project and surroundings, tested in a boundary layer wind tunnel. Information concerning the surrounding area is based on topographical maps and aerial photographs, information supplied by the Boston Redevelopment Authority (BRA), and building information obtained from the Sanborn Map Company. Additional information concerning site characteristics was obtained during a site visit.

The results presented in this report identify the pedestrian-level wind comfort resulting from three test conditions. These three test conditions were: 2000 Future No-Build, 1993 Phase I Build, and 2000 Full-Build. A summary of test results is found at the end of this section on Table 5-13, Summary of Mean and Effective Gust Wind Speeds.

5.2 OVERVIEW

Major buildings, especially those that protrude above their surroundings, often cause increased local wind speeds at the pedestrian level. Typically, wind speeds increase with elevation above the ground surface, and taller buildings intercept these faster winds and deflect them down to the pedestrian level. The funnelling of wind through gaps between buildings and the acceleration of wind around corners of buildings also may cause increases in wind speed. Conversely, if a building is surrounded by others of equivalent height, it may be protected from the prevailing upper-level winds, resulting in no significant changes to the local pedestrian-level wind environment. The most effective way to assess potential pedestrian-level wind

impacts around a proposed new building is to conduct scale model tests in a wind tunnel.

The consideration of wind in planning outdoor activity areas is important since high winds in an area tend to deter pedestrian use. For example, winds should be light or relatively light in areas where people would be sitting, such as outdoor cafes or playgrounds. For bus stops and other locations where people would be standing, somewhat higher winds can be tolerated. For frequently used sidewalks, where people are primarily walking, stronger winds are acceptable. For infrequently used areas, the wind comfort criteria can be relaxed even further. The actual effects of wind can range from pedestrian inconvenience, due to the blowing of dust and other loose material in a moderate breeze, to severe difficulty with walking due to the wind forces on the pedestrian.

5.3 METHODOLOGY

For this analysis of pedestrian-level wind conditions, the following conditions were tested:

2000 Future No-Build Condition - includes construction of the Boston City Hospital expansion on Albany Street, the Massachusetts Avenue Connector at grade, and no construction on the project site, Exhibit 5 - 1.

1993 Phase I Build Condition - includes an 80 foot high Parking Garage (Building 1) containing a daycare facility and retail stores, a 172 foot high Biomedical Research Building (Building 2) and a 110 foot high Medical Office Building (Building 3) on the project site; and construction of the Boston City Hospital expansion on Albany Street and an elevated Massachusetts Avenue Connector, Exhibit 5 - 2.

2000 Full-Build Condition - includes project site structures identified in the 1993 Phase I Build condition, 2 additional 110 foot high Research/Office Buildings (Buildings 4 and 5), a 100 foot high Hotel (Building 6), a second 82 foot high Parking Garage to be located off site at 600 Albany Street, and the Massachusetts Avenue Connector at grade, Exhibit 5 - 3.

The 1:400 scale model of the three test conditions and surroundings within a 1,600-foot radius of the project site, was tested in a boundary layer wind tunnel. Buildings greater than twenty-five stories in height and within a 2,400-foot radius of the site, also were added upwind of the model in the tunnel. The wind tunnel simulated the natural wind conditions in the area. A detailed description of the wind tunnel and the simulation of the natural wind is given in Appendix I, Wind.

The model was fitted with fifty-one omni-directional wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full-scale height of 5 feet above grade. The photographs in Exhibit 5 - 1 show the model in the 2000 Future No-Build condition, while the photographs in Exhibit 5 - 2 and Exhibit 5 - 3 depict the model in test conditions 1993 and 2000, respectively. A comparison of pedestrian-level winds at each sensor location for each test condition (for conditions Future No-Build, Phase I Build, and Full-Build) suggests the effect of each stage of the development at each location.

Wind speeds were recorded and analyzed for sixteen wind directions, in 22.5 degree increments, starting from true north. The test data were then combined with long-term meteorological data, recorded during the years 1945 to 1988 at Boston's Logan International Airport, in order to predict actual wind speeds. For this study, hourly wind records for each of the four seasons and over the entire year were analyzed. These wind statistics, graphically presented in Exhibit 5 - 4 through Exhibit 5 - 6 as "wind roses", summarize the annual and seasonal conditions for wind speed, strength, and direction in the Boston area.

The first two wind roses in Exhibit 5 - 4 provide a summary of the spring (March, April, and May) wind data for Logan International Airport. When considering all spring winds, the prevalent wind directions are from the north-northwest, northwest, west, and east. However, when only the pedestrian-level winds (i.e. 5 feet above ground level) that exceed 16 miles per hour (mph) (Strong Spring Winds) are included in the analysis, the most prominent directions are from the west through northwest, northeast and east-northeast. It should be noted that the 16 mph threshold speed will occur, on average, 1 percent of the time during the spring season in the Boston area.

The second two wind roses in Exhibit 5 - 4 illustrate the prevailing summer (June, July, and August) winds blowing from the south-southwest through west-northwest and north-northwest when considering all winds. When only the winds above the 1 percent probability wind speed of 12 mph (note: this wind speed changes slightly with the season) are considered, winds from the southwest, west-northwest, west-southwest, northwest, and northeast are predominant.

During the fall months (September, October, and November), winds favor the southwest through northwest, when considering all winds (see top left wind rose in Exhibit 5 -5). However, when considering winds above the one percent probability threshold of 15 mph (Strong Fall Winds), the west-northwest, northwest, northeast and east-northeast winds prevail (see top right wind rose in Exhibit 5 - 5).

For the winter (December, January, and February) wind conditions, the lower left wind rose in Exhibit 5 -5) indicates that the prevailing directions are from the west through northwest, when considering all winds. However, for winds above the 1 percent probability wind speed of 17 mph (Strong Winter Winds), the predominant winds are from the west-northwest, northwest, and east-northeast (see lower right wind rose in Exhibit 5 -5). Exhibit 5 - 6 summarizes the annual wind data. The top wind rose illustrates that the southwest, west, west-northwest, northwest, northeast, and east-northeast winds prevail when considering all winds. For winds above the 16 mph threshold wind speed (Strong Annual Winds), the prevailing wind directions are from the west, west-northwest, northwest, northeast, and east-northeast, as shown in the bottom wind rose in Exhibit 5 - 6.

This study used state-of-the-art measurement and analysis techniques to predict the level of comfort expected at each location described. There are, however, three sources of variability that should be considered. First, although the methods of measurement and analysis are performed with precision, the sensation of comfort among individuals can be quite variable. Variations in age, individual health, clothing, and other human factors can change a particular response of an individual. The comfort limits used in this report represent an average for the total population. Second, unforeseen changes in the project area, such as the construction or removal of buildings, could affect the conditions experienced at the site. Third, the prediction of wind speeds is necessarily a statistical procedure. The wind speeds reported are for the frequency of occurrence stated (1 percent). Higher wind speeds will occur but on a less frequent basis.

5.4 PEDESTRIAN WIND COMFORT CRITERIA

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that the effective gust velocity (mean hourly wind speed + 1.5 times the root-mean-square wind speed) exceeded 1 percent of the time should be less than or equal to 31 mph. The second set of criteria used by the BRA to determine the acceptability of specific locations is derived from the Melbourne criteria. These criteria are used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria measured according to mean wind speeds are essentially as follows:

Table 5 - 1*
BRA MEAN WIND CRITERIA

Dangerous Conditions	>27
Uncomfortable for Walking	> 19 and ≤27
Comfortable for Walking	> 15 and ≤19
Comfortable for Standing	> 12 and ≤15
Comfortable for Sitting	≤12

*Mean wind speed (mph) exceeded 1 percent of the time. Based on Melbourne wind criteria.

Source: Boston Redevelopment Authority

The wind climate found in a typical urban setting in Boston is generally comfortable for sidewalks and pedestrian thoroughfares. However, without any mitigation measures, this wind climate is likely to be uncomfortable for more passive activities such as sitting. The wind climate in Boston will generally satisfy the BRA effective gust velocity criterion of 31 mph.

5.5 RESULTS

The pedestrian-level wind data supporting the following discussion of the test results is located in Appendix I, Wind (Sections 2 and 3) and Tables Section (Section 1). They include the predicted mean wind speeds, the level of pedestrian wind comfort, and the effective gust speeds for the fifty-one test locations.

The annual and seasonal mean and effective gust wind speeds are identified on plans of the study area (Exhibit 5 - 7 through Exhibit 5 - 16). Exhibit 5 - 7 through Exhibit 5 - 11 identify the annual and seasonal mean wind velocities at each sensor location for the three test conditions. Exhibit 5 - 12 through Exhibit 5 - 16 identify the annual and seasonal effective gust wind velocity at each sensor location for the three test conditions. Exhibit 5 - 17 identifies the study area.

For additional information concerning the effects of each wind direction at any test location (i.e. mean wind speed and peak gust), refer to Appendix I, Wind (Section 3). Presented as wind speed ratios, the data represent the ratio of the wind speed recorded at each sensor location (i.e. five feet above grade) to the mean wind

speed which occurs at gradient height. These ratios indicate the directions from which the wind speeds are locally accelerated, along with their weighting factors. If strong acceleration occurs for a wind direction that also occurs frequently, then problem wind conditions can be expected. The use and interpretation of test data are described in the Appendix I, Wind (Section 3).

5.6 PEDESTRIAN-LEVEL WIND ASSESSMENT

The following is a summary of the predicted pedestrian-level wind conditions in and around the project site for the three conditions studied:

2000 Future No-Build

1993 Phase I Build

2000 Full-Build

The results of the wind analysis have been compared to the BRA wind criteria.

5.6.1 ASSESSMENT OF MEAN WIND SPEEDS

The test results for each of the fifty-one wind sensor locations are discussed in groupings according to the specific locations representing the following areas: Albany Street; East Concord Street and East Newton Street; Daycare Playground; ervice Road; Pedestrian Plaza; East Brookline Street; Service Street; and the Bicycle Path. For example, Albany Street is comprised of twenty-one test locations, namely, 1 through 21. These test locations are discussed under the Albany Street grouping for all three test configurations studied.

The pedestrian-level wind effect in each study area is described in the following text. A table which summarizes the number of locations suitable for either sitting, standing, or walking, for all seasons and all test configurations, has been included at the beginning of each area analysis. For example, of the 21 test locations along Albany Street all are suitable for either sitting, standing, or walking under the 2000 Future No-Build configuration during the spring season. With the 1993 Phase I Build in place and the 2000 Full-Build in place, all 21 locations remain comfortable for either sitting, standing, or walking during the spring season.

5.6.2 ALBANY STREET

2000 Future No-Build. Under Future No-Build conditions, the wind climate along Albany Street is suitable for sitting, standing, or walking at all twenty-one locations on an annual and seasonal basis.

1993 Phase I Build. The 1993 Phase I Build condition produces spring, summer, fall and annual wind speeds comparable to the Future No-Build condition. Wind conditions just exceeding comfortable for walking were recorded at Locations 3 and 4 during the winter. The main entrances to the Biomedical Research Building (Location 16) and to the Medical Office Building (Location 13) exhibit suitable seasonal and annual wind conditions, which are comfortable for sitting.

2000 Full-Build. The 2000 Full-Build condition produces spring, summer, fall and annual wind comfort levels similar to the 2000 Future No-Build conditions. During the spring, summer, fall and annually, all 21 locations are suitable for sitting, standing or walking. During the winter months, Locations 3 and 17 just exceed the category of comfortable for walking. The wind conditions at the entrances to the Biomedical Research Building and Medical Office Building were the same as the 1993 Phase I Build wind conditions.

Table 5-2 presents the results of the wind analysis for the twenty-one locations studied along Albany Street.

Table 5 - 2
ALBANY STREET WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	21	21	21
Spring	21	21	21
Summer	21	21	21
Fall	21	21	21
Winter	21	19	19

*Twenty-one locations tested on Albany Street for three test configurations: Locations 1 through 21.

Source: Rowan Williams Davies & Irwin, Inc.

5.7.3 EAST CONCORD STREET AND EAST NEWTON STREET

2000 Future No-Build. On a seasonal and annual basis, it is predicted that the wind conditions on the two streets will be suitable for sitting, standing, or walking with the exception of Location 51 which is uncomfortable for walking during the winter.

1993 Phase I Build. The 1993 Phase I Build condition produces lower seasonal and annual wind climates than the Future No-Build condition. The spring, summer, fall and annual wind climates produced by the 1993 test condition are suitable for sitting on East Concord Street. The winter wind climate on East Concord Street is conducive to sitting at Location 22 and standing at Location 23. The wind climate along East Newton Street is suitable for walking during the spring, fall winter and annually. This improves the uncomfortable condition noted under the Future No-Build scenario. During the summer months, the wind conditions are comfortable for standing.

2000 Full-Build. Wind conditions generally are predicted to improve (when compared to the Future No-Build conditions) along East Concord and East Newton Streets. Wind conditions comfortable for sitting are noted at both locations on East Concord Street during the summer, fall and annually. During the spring and winter, the wind conditions are suitable for sitting at Location 22 and comfortable for standing at Location 23. On East Newton Street, the wind conditions are suitable for standing in the summer and walking during the spring, fall, winter and annually. These conditions are well suited for the intended pedestrian use of the areas.

Table 5-3 presents the results of the wind analysis for the three locations studied along East Concord Street and East Newton Street.

Table 5 - 3
EAST CONCORD STREET, AND EAST NEWTON STREET WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING OR STANDING, OR WALKING

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	3	3	3
Spring	3	3	3
Summer	3	3	3
Fall	3	3	3
Winter	3	3	3

*Three locations tested on East Concord Street, and East Newton Street: Locations 22, 23 and 51.

Source: Rowan Williams Davies & Irwin, Inc.

5.6.4 DAYCARE PLAYGROUND

2000 Future No-Build. Wind speeds are predicted to be suitable for walking during the spring, fall, winter and annually. During the summer months the wind speeds are suitable for standing.

1993 Phase I Build. The 1993 Phase I Build condition produces lower wind speeds suitable for sitting during the spring, summer, fall, winter and annually. These wind conditions are very well suited for a daycare playground area.

2000 Full-Build. Wind conditions comfortable for sitting are predicted for all four seasons and annually. The positioning of the proposed buildings coupled with the surrounding fence and proposed landscape design effectively reduce the wind velocity in the daycare area. This is true for both the 1993 Phase I Build and 2000 Full-Build conditions.

Table 5-4 presents the results of the wind analysis for the two locations studied in the daycare playground area.

Table 5 - 4
DAYCARE PLAYGROUND WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING, OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	2	2	2
Spring	2	2	2
Summer	2	2	2
Fall	2	2	2
Winter	2	2	2

*Two locations tested in the Daycare playground: Locations 24 and 25.

Source: Rowan Williams Davies & Irwin, Inc.

5.6.5 SERVICE LANE

2000 Future No-Build. The wind climate is generally suitable for standing or walking at all locations during the spring, summer, fall, winter and annually.

1993 Phase I Build. Wind speeds are lower than the Future No-Build condition at Locations 26, 27, 28 and 30 on a seasonal and annual basis such that the wind climate becomes comfortable for sitting and standing. Wind speeds generally increased at Locations 29 and 31 but the wind climate remains well suited for the intended pedestrian usage reflecting conditions conducive to standing and walking. In the summer, wind conditions comfortable for sitting are predicted at the daycare entrance (Location 28) and wind conditions suitable for standing are expected at the parking garage entrance (Location 29). During the spring, fall, winter and annually, wind conditions suitable for standing are noted at the daycare entrance and wind conditions suitable for walking occur at the parking garage entrance. Again, these conditions are well suited for their respective areas.

2000 Full-Build. The seasonal and annual wind climates are suitable for either sitting, standing or walking. The wind speeds are equal to, or slightly higher than, the 1993 Phase I Build condition. At the daycare and parking garage entrances the summer, fall, winter and annual wind conditions remain identical to the 1993 Phase

I Build wind conditions. During the spring, the wind conditions at the daycare entrance just exceed conditions suitable for standing. The wind conditions at the parking garage entrance remain suitable for walking.

Table 5-5 presents the results of the wind analysis for the six locations studied along the Service Lane.

Table 5 - 5
SERVICE LANE WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING, OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	6	6	6
Spring	6	6	6
Summer	6	6	6
Fall	6	6	6
Winter	6	6	6

*Six locations tested in the Service Street: Locations 26 through 31.

Source: Rowan Williams Davies & Irwin, Inc.

5.6.6 PEDESTRIAN PLAZA

2000 Future No-Build. Under the 2000 Future No-Build condition, the wind environment is appropriate for sitting, standing, or walking at all seven locations seasonally and annually.

1993 Phase I Build. Construction of the proposed University Associates project (with the elevated Massachusetts Avenue Connector ramp in place) generally maintains or improves the Future No-Build wind climate along the Pedestrian Plaza for all seasons and annually. In particular, the wind climate at the Biomedical Research Building main entrance is comfortable for sitting year round. The proposed landscape design is a positive feature as it helps to create comfortable wind conditions.

2000 Full-Build. The 2000 Full-Build condition is predicted to produce wind conditions equal to, or better than, the 1993 Phase I Build conditions for all seasons and annually. The main entrance wind conditions at Locations 33 and 34 are comfortable for sitting seasonally and annually. Within the plaza, more locations report wind conditions suitable for sitting and standing due to the detailed landscape design and orientation of the buildings.

Table 5-6 presents the results of the wind analysis for the seven locations studied along the Pedestrian Plaza.

Table 5 - 6
PEDESTRIAN PLAZA WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING, OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	7	7	7
Spring	7	7	7
Summer	7	7	7
Fall	7	7	7
Winter	7	7	7

*Seven locations tested on the Pedestrian Plaza: Locations 32 through 38.

Source: Rowan Williams Davies & Irwin, Inc.

5.6.7 EAST BROOKLINE STREET

2000 Future No-Build. The majority of locations register wind speeds comfortable for standing on a seasonal and annual basis. Only Location 42 registers wind speeds more suitable for walking during the spring and winter seasons.

1993 Phase I Build. Three of the four locations are predicted to have seasonal and annual wind speeds lower than the Future No-Build condition. Location 40 has wind speeds equal to, or less than, the Future No-Build condition. The combination of building mass and orientation of the landscape design allows for these reductions.

2000 Full-Build. Wind conditions improve over the No-Build condition and are well suited for the area's intended pedestrian use. Very good seasonal and annual wind conditions comfortable for sitting are noted at the hotel entrance (Location 40).

Table 5-7 presents the results of the wind analysis for the four locations studied along East Brookline Street.

Table 5 - 7
EAST BROOKLINE STREET WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING, OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	4	4	4
Spring	4	4	4
Summer	4	4	4
Fall	4	4	4
Winter	4	4	4

*Four locations tested on East Brookline Street: Locations 39 through 42.

Source: Rowan Williams Davies & Irwin, Inc.

5.6.8 SERVICE STREET

2000 Future No-Build. The wind climate along this street is suitable for standing or walking for all four seasons and annually.

1993 Phase I Build. The 1993 Phase I Build condition produces seasonal and annual wind speeds that are generally lower than the Future No-Build condition and are considered very well suited for the intended pedestrian usage. Apart from Location 43, all locations report wind conditions comfortable for sitting. The wind conditions at Location 43 are suitable for standing.

2000 Full-Build. With the exception of Locations 45 and 46, the wind speeds are generally lower than, or similar to, the 1993 Phase I Build condition for all four seasons and annually. The wind conditions at the entrances to Buildings 4 and 5

(Locations 44 and 47) are comfortable for sitting all four seasons and annually. The seasonal and annual wind speeds at Locations 45 and 46 increase slightly, but remain lower than the Future No-Build condition and are well suited for the intended pedestrian use of the area.

Table 5-8 presents the results of the wind analysis for the five locations studied on the service street.

Table 5 - 8
SERVICE STREET WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING, OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	5	5	5
Spring	5	5	5
Summer	5	5	5
Fall	5	5	5
Winter	5	5	5

*Five locations tested on the Service Street: Locations 43 through 47.

Source: Rowan Williams Davies & Irwin, Inc.

5.6.9 BICYCLE PATH

2000 Future No-Build. The majority of locations register seasonal and annual wind speeds primarily suitable for walking related activities. During the summer, however, the wind conditions are appropriate for standing at all locations.

1993 Phase I Build. The seasonal and annual wind speeds are lower than the wind speeds reported for the Future No-Build condition. The majority of locations register wind speeds comfortable for sitting or standing. Location 50 recorded wind speeds suitable for walking during the spring. The good overall wind conditions are partially attributable to the proposed landscape design. The recorded wind speeds are well suited to the area's intended leisurely use by pedestrians.

2000 Full-Build. The seasonal and annual wind speeds are lower than the 2000 Future No-Build and 1993 Phase I Build conditions. Wind speeds comfortable for standing were recorded for all four seasons and annually. These wind conditions are very well suited to the area's intended use. The increased level of landscaping proposed for the Full-Build condition, along with the size of the buildings and their orientation, creates this comfortable wind environment.

Table 5-9 presents the results of the wind analysis for the three locations studied along the bicycle path.

Table 5 - 9
BICYCLE PATH WIND CONDITIONS: NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	3	3	3
Spring	3	3	3
Summer	3	3	3
Fall	3	3	3
Winter	3	3	3

*Three locations tested along the bicycle path: Locations 48, 49 and 50.

Source: Rowan Williams Davies & Irwin, Inc.

5.6.10 ASSESSMENT OF EFFECTIVE GUST SPEEDS

The Wind Appendix presents the following data: effective gust wind speeds for each of the four seasons, plus annually; annual effective gust speeds for the sensor test conditions at each study location; and a comparative analysis of the effective gust velocities at each location for the three configurations studied.

2000 Future No-Build. Under the Future No-Build condition, the effective gust criterion is not exceeded at any location on an annual or seasonal basis.

1993 Phase I Build. The construction of the parking garage, biomedical research facility and adjacent office building result in fifty-one locations meeting the gust criterion during the spring, summer, fall and annually. Fifty locations meet the gust criterion during the winter. The exception is Location 3 which just exceeds the criterion by 1 mph. Acceptable wind conditions are noted at the daycare playground, all proposed building entrances, the bicycle path and along most major pedestrian traffic arteries.

2000 Full-Build Condition. All fifty-one locations examined are within the gust criterion of 31 mph for the spring, summer, fall and annually. Only Location 3 exceeds the gust criterion by two mph during the winter season. Otherwise, this location meets the gust criterion for the remaining seasons and annually. The following report section discusses some wind control measures that may assist in reducing the wind activity at this location.

Table 5-10 presents the results of the wind analysis of effective gusts for all locations studied on and around the University Associates project site.

Table 5 - 10
NUMBER OF LOCATIONS MEETING THE EFFECTIVE GUST CRITERION*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	51	51	51
Spring	51	51	51
Summer	51	51	51
Fall	51	51	51
Winter	51	50	50

*Fifty-one locations tested for all three test conditions: Locations 1 through 51.

Source: Rowan Williams Davies & Irwin, Inc.

5.7 MITIGATION MEASURES

The quantitative tests incorporate the detailed landscape designs for both the Phase I Build and Full-Build scenarios. The landscaping provides very positive results as

wind activity in various areas of concern (noted in the qualitative report) were reduced, thus creating comfortable wind conditions. This is most noticeable along the Service Street and in the Pedestrian Plaza. The results of the quantitative wind tunnel tests also indicate only one location which exceeds the Effective Gust criterion and only three locations that just exceed conditions comfortable for walking, as shown on Tables 5-11 and 5-12. These locations are grouped on Albany Street across from the project Service Street entrance between Buildings 1 and 2.

Location 3 (on Albany Street across from the project Service Street entrance) exceeds the 31 mph Effective Gust criterion during the winter season. Locations 3, 4 (on Albany Street across from Building 1) and 17 (on the corner of Albany Street and the Service Street entrance adjacent to Building 2) exceed conditions comfortable for walking only during the winter months. These locations are exposed primarily to northwest and north-northwest winds interacting with the proposed University Associates project to the south of Albany Street. Prior to the construction of the University Associates project, northwest quadrant winds flowed unhindered across Albany Street and dissipated in the large open parking area, that is the current project site. Upon construction of the University Associates project, these winds are blocked and redirected along Albany Street, resulting in the increased wind activity at Locations 3, 4 and 17.

The increased wind activity at these locations is very similar to the existing conditions along East Newton Street between the Goldman School of Dentistry and The University Hospital. These conditions are identified by Location 51 which has an existing mean winter wind velocity of 20 mph and an existing effective gust winter wind velocity of 31 mph. With the proposed project in place, the wind conditions at location 51 are improved.

The conditions at Locations 3, 4, and 17 during the winter are considered borderline. However, if mitigation of these conditions were warranted, the type of wind control measures that could be developed include a large canopy along the north facade of the Biomedical Research Building and/or windscreens/vegetation to the north of Albany Street, between the Boston University Medical Center and the Fuller Mental Health Building. A general description of the function of these wind control measures follows.

Canopy

A canopy is used to deflect winds that are intercepted at higher levels above grade and directed downward to pedestrian level. For this situation, a canopy constructed 15 to 20 feet above grade, extending a minimum of 10 feet horizontally from the

facade of the Biomedical Research building toward Albany Street, and extending across a good portion of the face of the building would be an effective measure.

Windscreens/Vegetation.

Windscreens (coniferous landscaping or architectural design) can be used to mitigate both horizontal and vertical wind action. To effectively disperse the wind, the windscreens suggested for this particular project vary from 10 to 15 feet in height and have a porosity of approximately 40 to 60 percent. This type of mitigation would need to be positioned parallel to Albany Street on the north side of Locations 3 and 4 extending from the angled parking spaces to the Fuller Mental Health Building.

Specific application of a canopy and windscreens/vegetation for the Phase I Building and Full-Build scenarios is discussed below. It is worth noting that the location of the increased wind activity makes it difficult to mitigate as it is off-site. The application of a canopy and/or windscreens/vegetation will need to be carefully examined as to the impact on the project as a whole, such as installation and maintenance of overhead utilities and landscaping and design elements.

1993 Phase I Build

A windscreen (coniferous landscaping or architectural design) on the north side of Albany Street, to the north of Location 3 and extending east to the west facade of the Fuller Mental Health Building, may reduce the wind activity at Location 3. The windscreen would provide some protection from northwest quadrant winds, descending between the Fuller Mental Health Center and the Boston University Medical Center, and being redirected east along Albany Street by the proposed Biomedical Research building. A canopy on the north facade of the Biomedical Research building would reduce the impact of northwest quadrant winds deflecting down the north facade to grade level and flowing back across the street.

2000 Full-Build

The wind control devices identified for the 1993 Phase I Build condition would be equally effective for the 2000 Full-Build condition. While implementation of these devices will likely prove beneficial for mitigating certain wind conditions, they may be considered excessive since the conditions they mitigate only occur in the winter season, are borderline cases, and reflect conditions which currently exist in many commercial areas of Boston.

5.8 CONCLUSION

Overall, the project has a very positive impact on the area's wind conditions. For both the 1993 Phase I Build and 2000 Full-Build scenarios, the wind speeds are generally equal to, or less than, the 2000 Future No-Build Conditions. Only one out of fifty-one locations recorded wind speeds that exceed the BRA gust criterion of 31 mph as shown on Table 5 - 12 and only two, out of fifty-one locations, report wind conditions that just exceed conditions comfortable for walking for Phase I Build and two, out of 51 locations, for Full-Build.

The proposed construction phases of the project (1993 Phase I Build and 2000 Full-Build) will partially intercept and deflect upper-level winds down to grade. In the few areas of anticipated high wind activity, conditions are primarily due to the exposure of these areas to predominant northwest quadrant winds, and the channelling and acceleration of these winds between and around existing and proposed buildings. This wind condition is similar to existing conditions in the area as well as in many downtown Boston locations. Furthermore, this condition just exceeds the BRA criteria and is limited to the winter months. In view of the overall positive wind impacts resulting from the project, this condition is not considered a major impact.

The wind conditions presented in this section were achieved using the landscaping plan current at the time of testing. Any significant changes to the landscaping plan may affect the wind conditions on and around the project site.

Table 5 - 11
NUMBER OF LOCATIONS SUITABLE FOR SITTING, STANDING, OR WALKING*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	51	51	51
Spring	51	51	51
Summer	51	51	51
Fall	51	51	51
Winter	51	49	49

*Fifty-one locations tested for all three conditions: Locations 1 through 51.

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 12
NUMBER OF LOCATIONS MEETING THE EFFECTIVE GUST CRITERION*

Season	2000 Future No-Build	1993 Phase I Build	2000 Full-Build
Annual	51	51	51
Spring	51	51	51
Summer	51	51	51
Fall	51	51	51
Winter	51	50	50

*Fifty-one locations tested for all three conditions: Locations 1 through 51.

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF MEAN WIND SPEEDS

Albany Street

Location	Configuration	Spring	Summer	Fall	Winter	Annual
1	2000 No-Build	11	9	11	11	11
	1993 Phase I Build	12	10	12	13	12
	2000 Full-Build	12	10	12	13	12
2	2000 No-Build	15	11	14	15	14
	1993 Phase I Build	12	10	12	13	12
	2000 Full-Build	13	11	12	14	13
3	2000 No-Build	14	11	13	15	14
	1993 Phase I Build	19	14	18	20	19
	2000 Full-Build	19	15	18	21	19
4	2000 No-Build	18	14	17	17	17
	1993 Phase I Build	19	15	18	20	19
	2000 Full-Build	18	14	18	19	18
5	2000 No-Build	16	14	16	17	16
	1993 PartiaBuild	17	13	16	18	16
	2000 Full-Build	17	13	16	18	17
6	2000 No-Build	14	12	14	15	14
	1993 Phase I Build	13	11	13	14	13
	2000 Full-Build	14	11	13	14	13
7	2000 No-Build	12	10	12	12	12
	1993 Phase I Build	14	11	13	14	14
	2000 Full-Build	12	10	12	13	12
8	2000 No-Build	14	12	13	13	13
	1993 Phase I Build	12	9	11	12	11
	2000 Full-Build	13	10	13	13	13
9	2000 No-Build	15	11	14	14	14
	1993 Phase I Build	14	11	13	14	14
	2000 Full-Build	13	10	12	13	12
10	2000 No-Build	14	11	13	13	13
	1993 Phase I Build	11	9	11	12	11
	2000 Full-Build	12	9	11	12	11
11	2000 No-Build	14	12	14	14	14
	1993 Phase I Build	11	9	11	12	11
	2000 Full-Build	15	11	14	16	14

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 -13
SUMMARY OF MEAN WIND SPEEDS (con't)

Albany Street

Location	Configuration	Spring	Summer	Fall	Winter	Annual
12	2000 No-Build	14	12	14	14	14
	1993 Phase I Build	13	10	13	14	13
	2000 Full-Build	10	8	10	11	10
13	2000 No-Build	15	13	14	15	14
	1993 Phase I Build	12	9	11	13	12
	2000 Full-Build	12	9	11	13	12
14	2000 No-Build	14	12	13	14	14
	1993 Phase I Build	15	12	14	16	15
	2000 Full-Build	15	12	14	16	15
15	2000 No-Build	13	10	12	14	13
	1993 Phase I Build	14	11	13	15	13
	2000 Full-Build	13	10	13	14	13
16	2000 No-Build	16	12	15	15	15
	1993 Phase I Build	8	7	8	9	8
	2000 Full-Build	8	7	8	9	8
17	2000 No-Build	15	12	14	15	14
	1993 Phase I Build	18	15	17	19	18
	2000 Full-Build	19	17	19	20	19
18	2000 No-Build	14	11	13	13	13
	1993 Phase I Build	17	15	17	18	17
	2000 Full-Build	18	15	18	19	18
19	2000 No-Build	13	10	12	12	12
	1993 Phase I Build	14	11	13	15	14
	2000 Full-Build	14	11	13	15	14
20	2000 No-Build	15	11	14	15	14
	1993 Phase I Build	13	11	12	14	13
	2000 Full-Build	13	11	13	14	13
21	2000 No-Build	14	11	13	14	14
	1993 Phase I Build	11	9	11	12	11
	2000 Full-Build	11	9	11	12	11

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF MEAN WIND SPEEDS (con't)

Location	Configuration	Spring	Summer	Fall	Winter	Annual
East Concord Street						
22	2000 No-Build	16	13	15	16	15
	1993 Phase I Build	9	8	9	9	9
	2000 Full-Build	9	8	8	9	9
23	2000 No-Build	15	12	15	15	15
	1993 Phase I Build	12	10	11	13	12
	2000 Full-Build	13	10	12	13	12
Daycare Playground						
24	2000 No-Build	18	15	18	18	18
	1993 Phase I Build	11	8	10	11	10
	2000 Full-Build	12	9	11	11	11
25	2000 No-Build	16	13	16	16	16
	1993 Phase I Build	9	7	8	9	8
	2000 Full-Build	11	9	10	10	10
Service Lane						
26	2000 No-Build	16	11	15	14	14
	1993 Phase I Build	11	8	11	11	11
	2000 Full-Build	13	11	12	13	12
27	2000 No-Build	18	14	17	17	17
	1993 Phase I Build	12	9	11	13	12
	2000 Full-Build	16	13	15	16	15
28	2000 No-Build	17	14	16	17	16
	1993 Phase I Build	13	12	13	14	13
	2000 Full-Build	16	12	15	15	15
29	2000 No-Build	15	13	15	15	15
	1993 Phase I Build	19	14	17	18	18
	2000 Full-Build	18	14	16	17	17
30	2000 No-Build	14	11	14	14	14
	1993 Phase I Build	11	9	11	12	11
	2000 Full-Build	11	9	11	12	11
31	2000 No-Build	16	13	15	16	15
	1993 Phase I Build	19	15	18	19	18
	2000 Full-Build	16	13	15	17	16

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF MEAN WIND SPEEDS (con't)

Location	Configuration	Spring	Summer	Fall	Winter	Annual
Pedestrian Plaza						
32	2000 No-Build	15	13	15	15	15
	1993 Phase I Build	16	15	16	17	16
	2000 Full-Build	13	11	13	14	13
33	2000 No-Build	15	12	14	15	14
	1993 Phase I Build	8	7	8	8	8
	2000 Full-Build	9	7	8	9	9
34	2000 No-Build	16	13	15	15	15
	1993 Phase I Build	14	13	14	15	14
	2000 Full-Build	8	7	8	9	8
35	2000 No-Build	17	14	16	16	16
	1993 Phase I Build	14	12	14	14	14
	2000 Full-Build	14	11	13	14	13
36	2000 No-Build	15	12	15	15	15
	1993 Phase I Build	14	11	13	13	13
	2000 Full-Build	12	10	11	12	11
37	2000 No-Build	16	13	16	16	15
	1993 Phase I Build	15	13	14	14	14
	2000 Full-Build	9	7	8	9	9
38	2000 No-Build	16	13	16	16	16
	1993 Phase I Build	16	13	16	17	16
	2000 Full-Build	9	7	8	9	8
East Brookline Street						
39	2000 No-Build	15	12	14	14	14
	1993 Phase I Build	13	11	13	13	13
	2000 Full-Build	14	10	13	15	13
40	2000 No-Build	14	13	14	15	14
	1993 Phase I Build	14	13	14	14	14
	2000 Full-Build	10	7	9	10	9
41	2000 No-Build	14	12	13	14	14
	1993 Phase I Build	12	10	12	13	12
	2000 Full-Build	13	10	12	13	12
42	2000 No-Build	16	13	15	16	15
	1993 Phase I Build	13	10	12	13	12
	2000 Full-Build	14	12	13	14	14

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF MEAN WIND SPEEDS (con't)

Location	Configuration	Spring	Summer	Fall	Winter	Annual
Service Street						
43	2000 No-Build	17	14	16	17	16
	1993 Phase I Build	15	11	14	15	14
	2000 Full-Build	11	9	11	11	11
44	2000 No-Build	16	13	16	16	16
	1993 Phase I Build	10	8	10	11	10
	2000 Full-Build	7	6	7	8	7
45	2000 No-Build	16	13	15	15	15
	1993 Phase I Build	11	9	11	11	11
	2000 Full-Build	14	10	13	13	13
46	2000 No-Build	17	14	17	17	17
	1993 Phase I Build	12	9	11	12	11
	2000 Full-Build	13	10	12	12	12
47	2000 No-Build	17	14	16	17	16
	1993 Phase I Build	11	9	11	12	11
	2000 Full-Build	7	6	7	8	7
Bicycle Path						
48	2000 No-Build	17	14	17	17	17
	1993 Phase I Build	12	11	12	13	12
	2000 Full-Build	12	10	11	12	11
49	2000 No-Build	17	14	16	17	16
	1993 Phase I Build	13	10	12	12	12
	2000 Full-Build	11	9	11	11	11
50	2000 No-Build	17	15	17	17	17
	1993 Phase I Build	16	12	15	15	15
	2000 Full-Build	12	10	12	12	12
East Newton Street						
51	2000 No-Build	19	14	18	20	19
	1993 Phase I Build	18	13	16	18	17
	2000 Full-Build	17	13	16	18	16

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF EFFECTIVE GUST WIND SPEEDS (con't)

Albany Street

Location	Configuration	Spring	Summer	Fall	Winter	Annual
1	2000 No-Build	18	14	17	18	17
	1993 Phase I Build	18	15	18	20	18
	2000 Full-Build	19	16	18	20	19
2	2000 No-Build	21	16	20	21	20
	1993 Phase I Build	18	15	18	20	18
	2000 Full-Build	19	16	19	20	19
3	2000 No-Build	22	17	21	23	21
	1993 Phase I Build	29	23	28	32	29
	2000 Full-Build	30	23	28	33	30
4	2000 No-Build	25	21	24	25	24
	1993 Phase I Build	29	23	28	30	28
	2000 Full-Build	28	22	27	30	28
5	2000 No-Build	26	22	25	26	25
	1993 Phase I Build	28	22	27	29	27
	2000 Full-Build	28	22	27	30	28
6	2000 No-Build	23	19	22	23	22
	1993 Phase I Build	22	18	21	23	21
	2000 Full-Build	23	18	22	24	22
7	2000 No-Build	20	16	19	19	19
	1993 Phase I Build	23	17	22	24	22
	2000 Full-Build	21	16	20	23	21
8	2000 No-Build	20	17	20	20	20
	1993 Phase I Build	18	13	17	18	17
	2000 Full-Build	19	15	18	19	18
9	2000 No-Build	23	18	22	23	22
	1993 Phase I Build	21	17	20	21	21
	2000 Full-Build	19	15	18	19	19
10	2000 No-Build	21	17	20	21	20
	1993 Phase I Build	18	14	17	19	18
	2000 Full-Build	19	14	18	20	18
11	2000 No-Build	21	17	20	21	20
	1993 Phase I Build	18	14	17	18	17
	2000 Full-Build	23	17	21	24	22

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF EFFECTIVE GUST WIND SPEEDS (con't)

Albany Street

Location	Configuration	Spring	Summer	Fall	Winter	Annual
12	2000 No-Build	21	18	21	21	21
	1993 Phase I Build	20	16	19	22	20
	2000 Full-Build	16	13	15	18	16
13	2000 No-Build	22	19	22	23	22
	1993 Phase I Build	19	15	18	21	19
	2000 Full-Build	19	15	18	21	19
14	2000 No-Build	21	18	21	22	21
	1993 Phase I Build	25	19	23	27	24
	2000 Full-Build	25	20	24	27	25
15	2000 No-Build	21	17	20	22	20
	1993 Phase I Build	23	18	22	25	23
	2000 Full-Build	23	17	21	25	22
16	2000 No-Build	23	19	23	23	23
	1993 Phase I Build	14	10	13	15	13
	2000 Full-Build	14	11	13	15	14
17	2000 No-Build	23	18	22	23	22
	1993 Phase I Build	27	23	27	29	27
	2000 Full-Build	29	26	29	31	29
18	2000 No-Build	21	17	20	21	20
	1993 Phase I Build	27	23	26	29	27
	2000 Full-Build	27	24	27	30	28
19	2000 No-Build	19	16	19	20	19
	1993 Phase I Build	23	17	22	25	22
	2000 Full-Build	23	18	22	25	22
20	2000 No-Build	22	17	21	23	21
	1993 Phase I Build	20	17	19	21	20
	2000 Full-Build	20	18	20	22	20
21	2000 No-Build	22	17	21	23	21
	1993 Phase I Build	18	15	17	20	18
	2000 Full-Build	18	15	17	19	18

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF EFFECTIVE GUST WIND SPEEDS (con't)

Location	Configuration	Spring	Summer	Fall	Winter	Annual
East Concord Street						
22	2000 No-Build	25	20	24	26	25
	1993 Phase I Build	14	13	14	15	14
	2000 Full-Build	14	12	14	15	14
23	2000 No-Build	23	19	22	23	22
	1993 Phase I Build	21	17	19	22	20
	2000 Full-Build	21	17	20	22	21
Daycare Playground						
24	2000 No-Build	25	21	24	26	25
	1993 Phase I Build	16	12	15	15	15
	2000 Full-Build	17	13	16	16	16
25	2000 No-Build	24	20	23	24	23
	1993 Phase I Build	13	11	13	13	13
	2000 Full-Build	18	14	16	17	17
Service Lane						
26	2000 No-Build	22	17	21	22	21
	1993 Phase I Build	19	14	18	18	18
	2000 Full-Build	20	17	19	20	20
27	2000 No-Build	25	21	24	25	24
	1993 Phase I Build	20	16	19	22	20
	2000 Full-Build	25	21	24	24	24
28	2000 No-Build	24	20	23	25	24
	1993 Phase I Build	20	18	20	21	20
	2000 Full-Build	24	18	22	23	22
29	2000 No-Build	23	20	23	24	23
	1993 Phase I Build	27	20	25	26	25
	2000 Full-Build	27	20	25	26	25
30	2000 No-Build	22	18	21	22	22
	1993 Phase I Build	20	16	19	21	20
	2000 Full-Build	21	17	20	23	21
31	2000 No-Build	24	20	23	24	23
	1993 Phase I Build	28	23	27	29	28
	2000 Full-Build	26	21	25	27	26

Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF EFFECTIVE GUST WIND SPEEDS (con't)

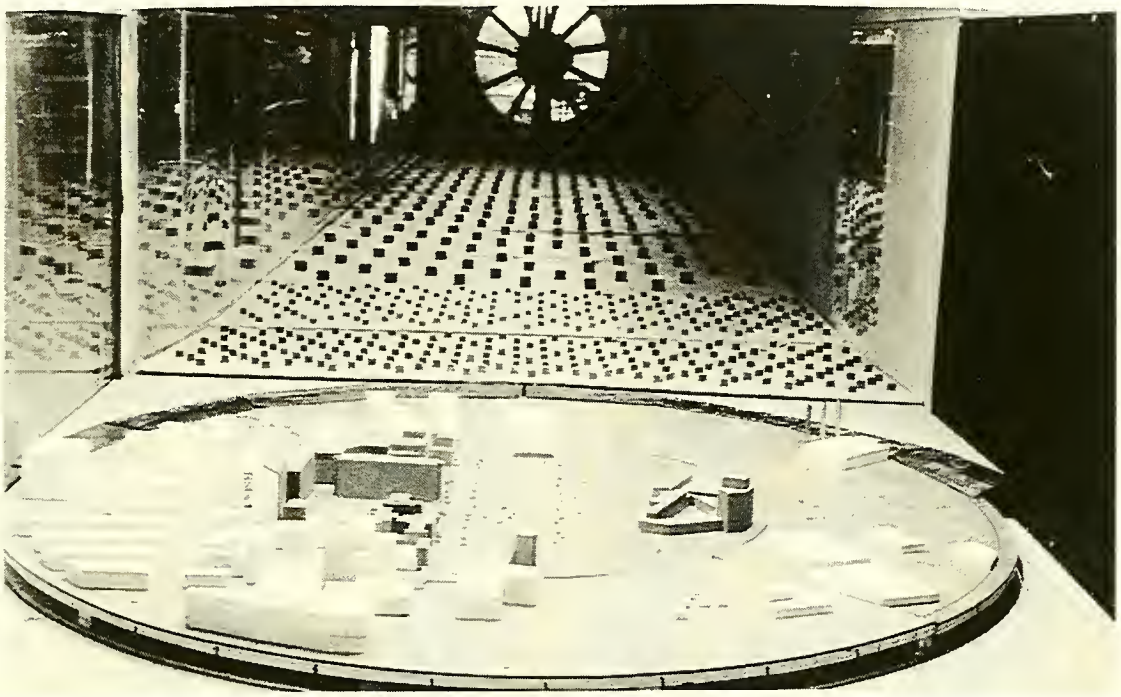
Location	Configuration	Spring	Summer	Fall	Winter	Annual
Pedestrian Plaza						
32	2000 No-Build	23	20	23	24	23
	1993 Phase I Build	26	24	26	27	26
	2000 Full-Build	22	18	21	23	22
33	2000 No-Build	22	19	22	22	22
	1993 Phase I Build	12	10	12	12	12
	2000 Full-Build	13	11	12	14	13
34	2000 No-Build	23	19	23	24	23
	1993 Phase I Build	23	20	23	24	23
	2000 Full-Build	12	9	11	12	12
35	2000 No-Build	24	20	23	24	23
	1993 Phase I Build	23	19	22	23	22
	2000 Full-Build	22	18	20	22	21
36	2000 No-Build	23	19	22	23	22
	1993 Phase I Build	23	18	22	22	22
	2000 Full-Build	19	15	18	19	18
37	2000 No-Build	23	19	23	24	23
	1993 Phase I Build	24	20	23	23	23
	2000 Full-Build	13	11	12	14	13
38	2000 No-Build	24	20	24	25	24
	1993 Phase I Build	24	20	24	25	24
	2000 Full-Build	13	10	12	13	12
East Brookline Street						
39	2000 No-Build	22	18	22	22	22
	1993 Phase I Build	21	18	20	21	21
	2000 Full-Build	21	16	20	23	21
40	2000 No-Build	22	19	21	22	22
	1993 Phase I Build	23	19	22	23	22
	2000 Full-Build	15	11	14	15	14
41	2000 No-Build	21	18	21	22	21
	1993 Phase I Build	20	16	19	21	20
	2000 Full-Build	19	16	19	19	19
42	2000 No-Build	25	20	24	25	24
	1993 Phase I Build	21	17	20	21	20
	2000 Full-Build	20	18	20	20	20

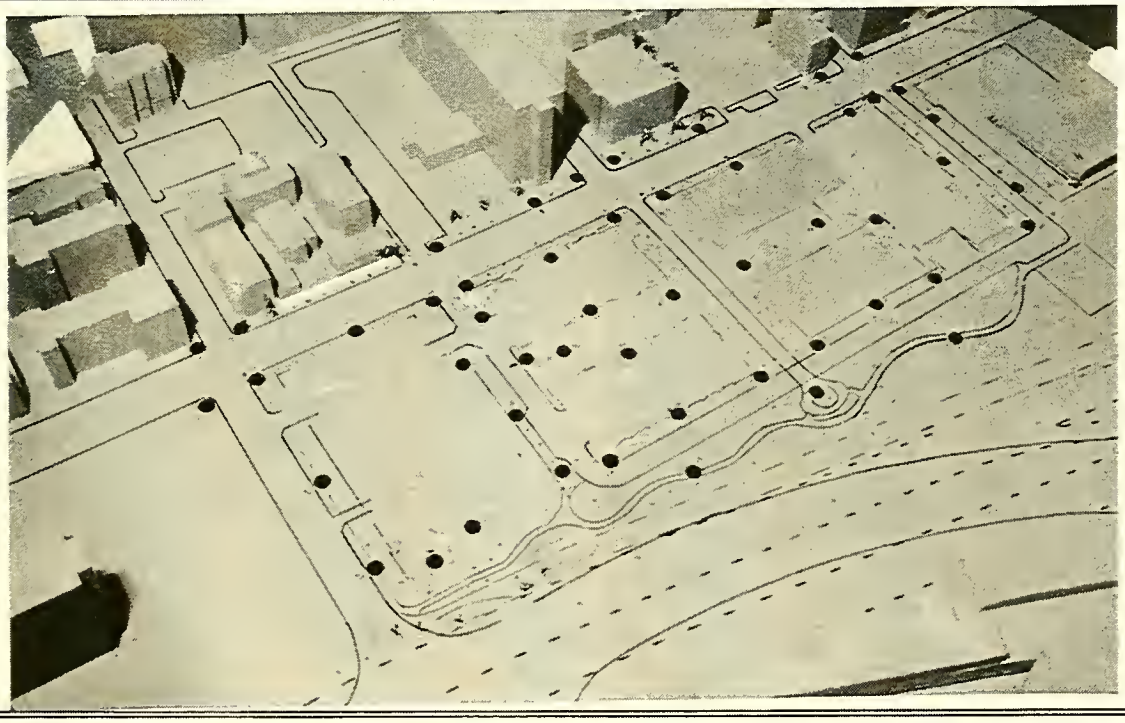
Source: Rowan Williams Davies & Irwin, Inc.

Table 5 - 13
SUMMARY OF EFFECTIVE GUST WIND SPEEDS (con't)

Location	Configuration	Spring	Summer	Fall	Winter	Annual
Service Street						
43	2000 No-Build	24	20	24	25	24
	1993 Phase I Build	22	17	21	23	21
	2000 Full-Build	19	15	18	19	18
44	2000 No-Build	24	20	23	24	23
	1993 Phase I Build	17	13	17	18	17
	2000 Full-Build	11	9	10	11	10
45	2000 No-Build	23	19	22	23	22
	1993 Phase I Build	17	14	17	17	17
	2000 Full-Build	20	16	19	19	19
46	2000 No-Build	24	20	24	25	24
	1993 Phase I Build	18	14	17	18	17
	2000 Full-Build	20	16	19	20	19
47	2000 No-Build	24	20	23	24	24
	1993 Phase I Build	19	15	18	21	19
	2000 Full-Build	10	9	10	11	10
Bicycle Path						
48	2000 No-Build	25	21	24	25	24
	1993 Phase I Build	20	17	19	21	20
	2000 Full-Build	18	15	18	18	18
49	2000 No-Build	24	20	24	25	24
	1993 Phase I Build	19	16	18	19	18
	2000 Full-Build	17	14	17	18	17
50	2000 No-Build	25	21	24	25	24
	1993 Phase I Build	23	18	22	22	22
	2000 Full-Build	19	16	18	19	18
East Newton Street						
51	2000 No-Build	30	22	28	31	29
	1993 Phase I Build	27	20	26	28	26
	2000 Full-Build	27	20	25	28	26

Source: Rowan Williams Davies & Irwin, Inc.

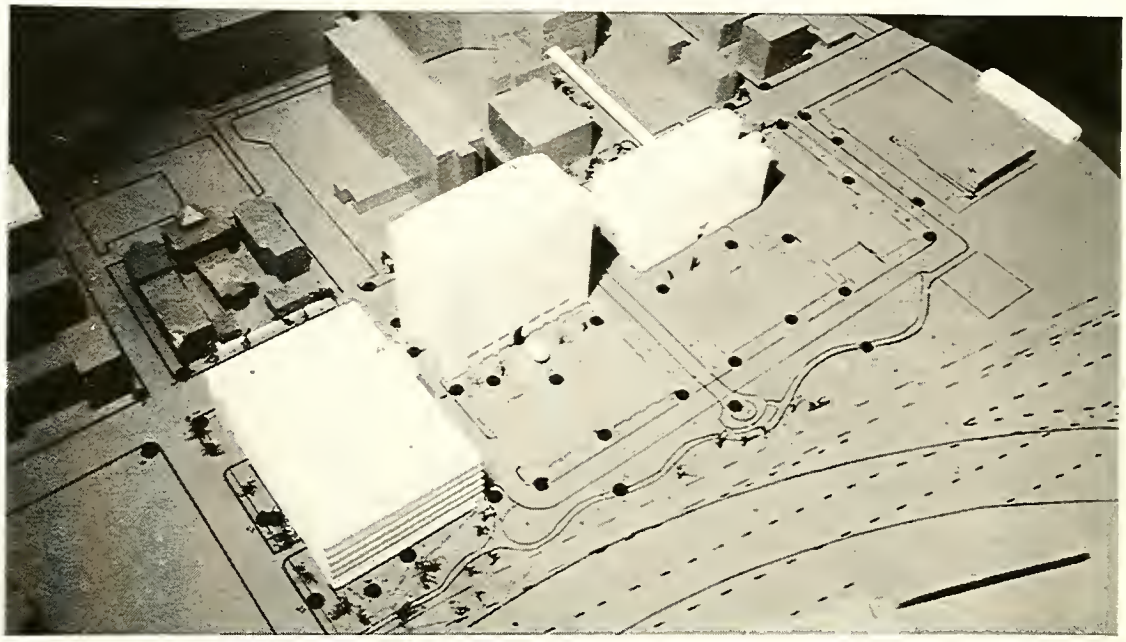


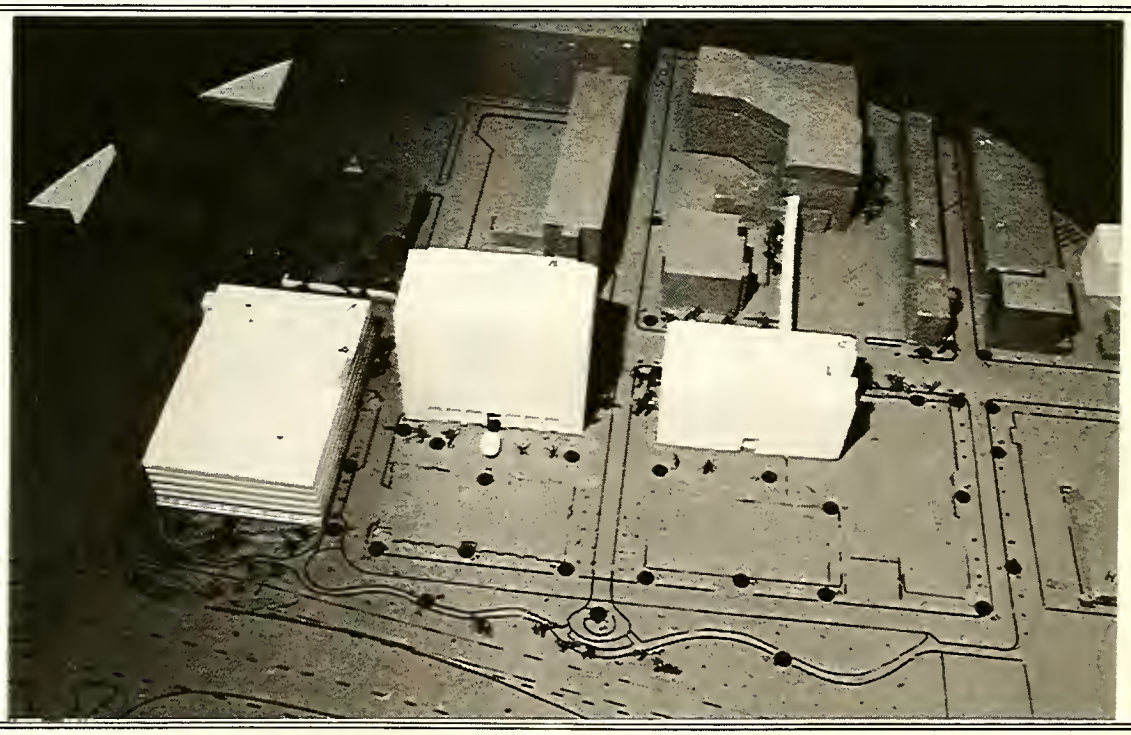


Microclimate Study Model - 2000 Future No-Build

Prepared By:
Rowan Williams Davies & Irwin, Inc.

Exhibit 5 - 1

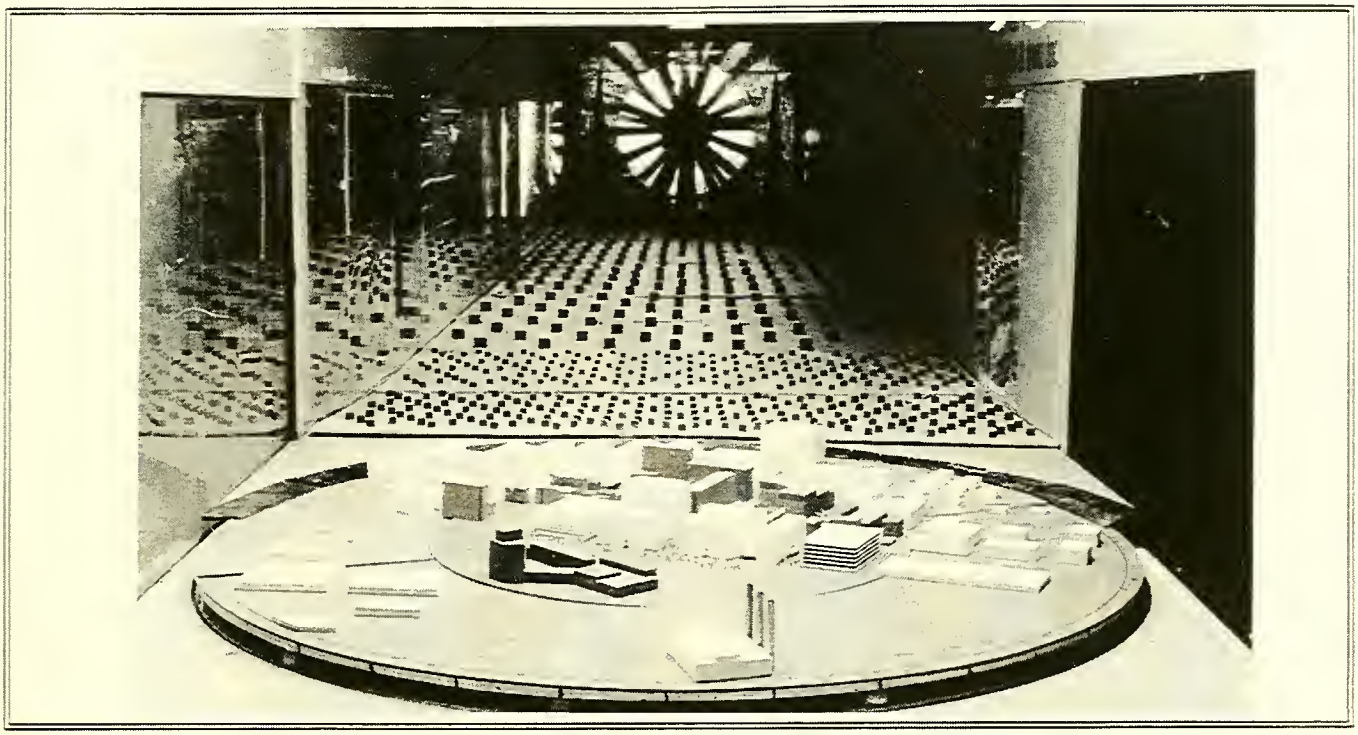


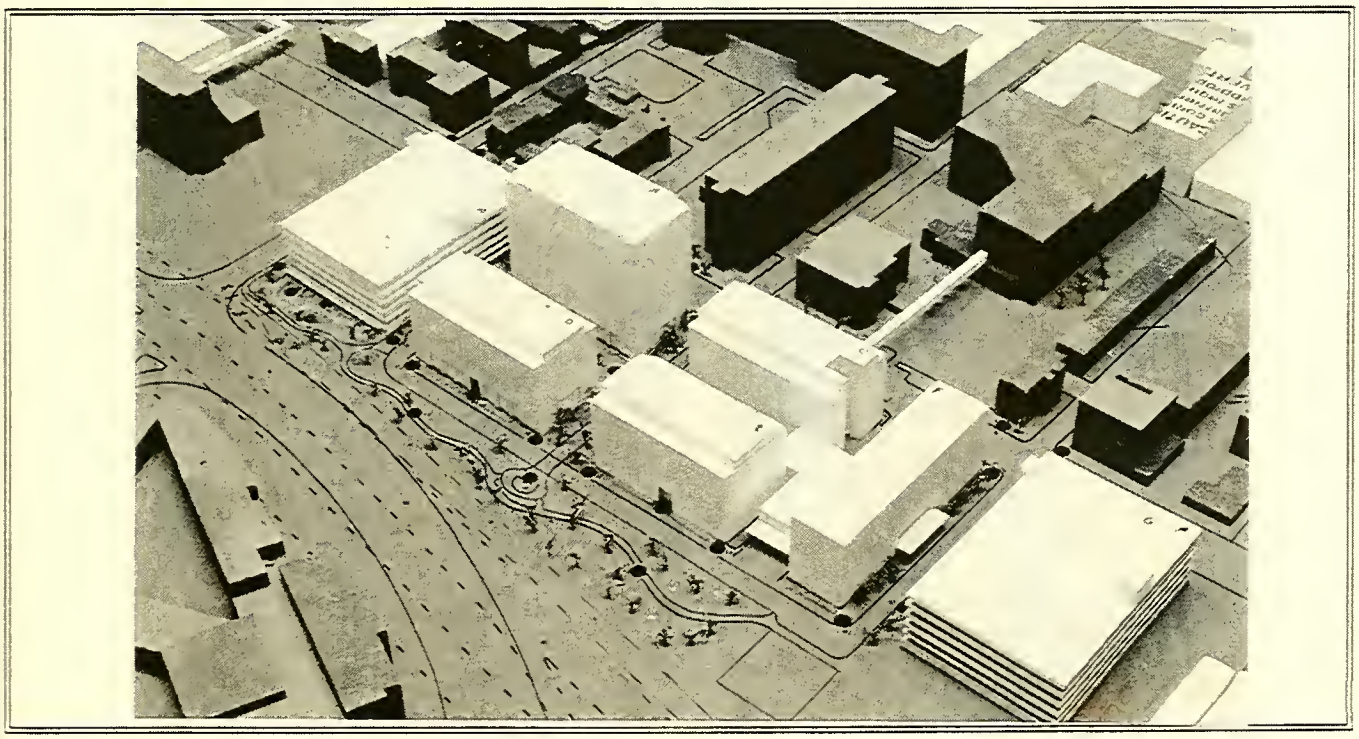


Microclimate Study Model - 1993 Partial-Build

Prepared By:
Rowan Williams Davies & Irwin, Inc.

Exhibit 5 - 2

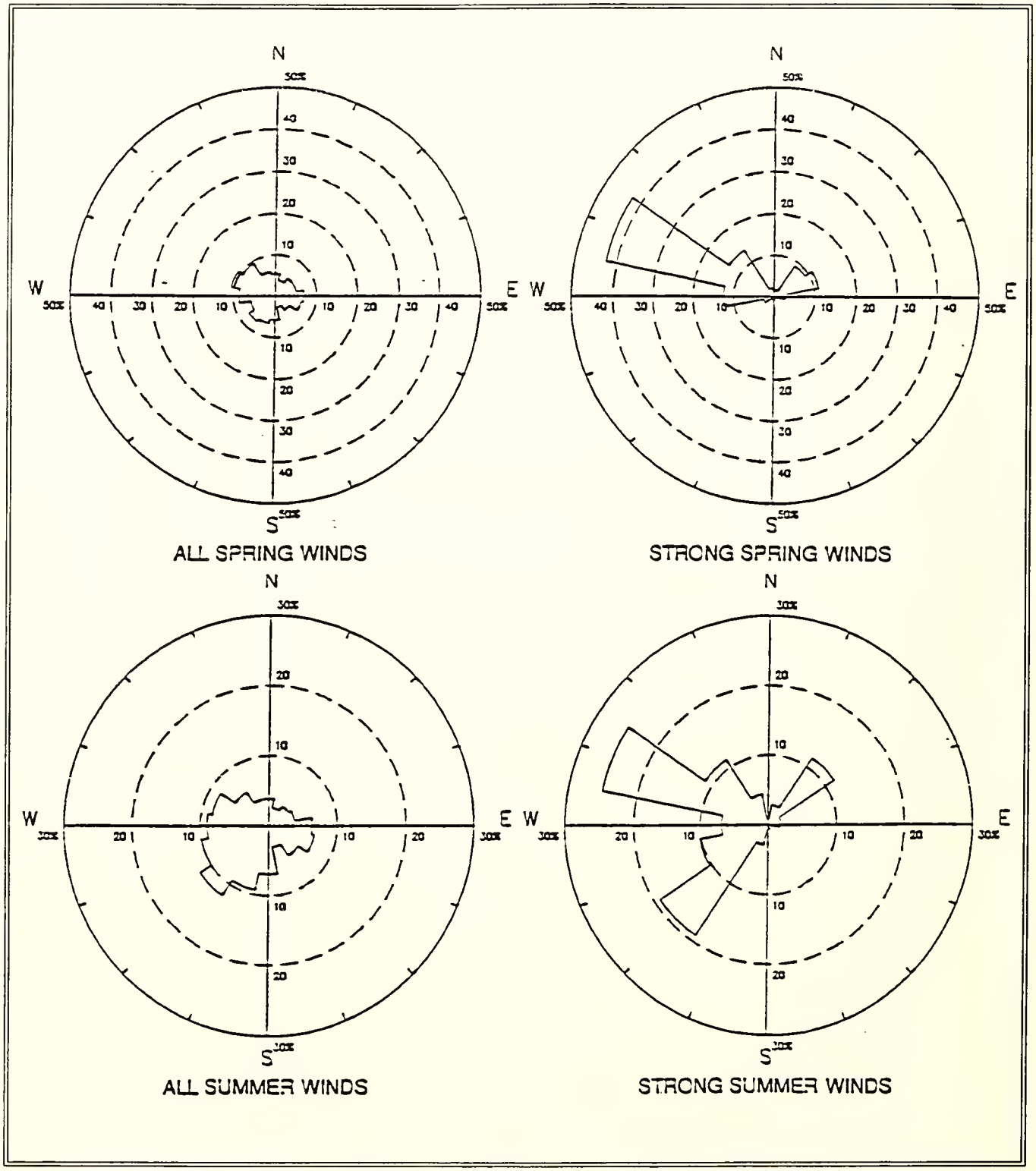




Microclimate Study Model - 2000 Full-Build

Prepared By:
Rowan Williams Davies & Irwin, Inc.

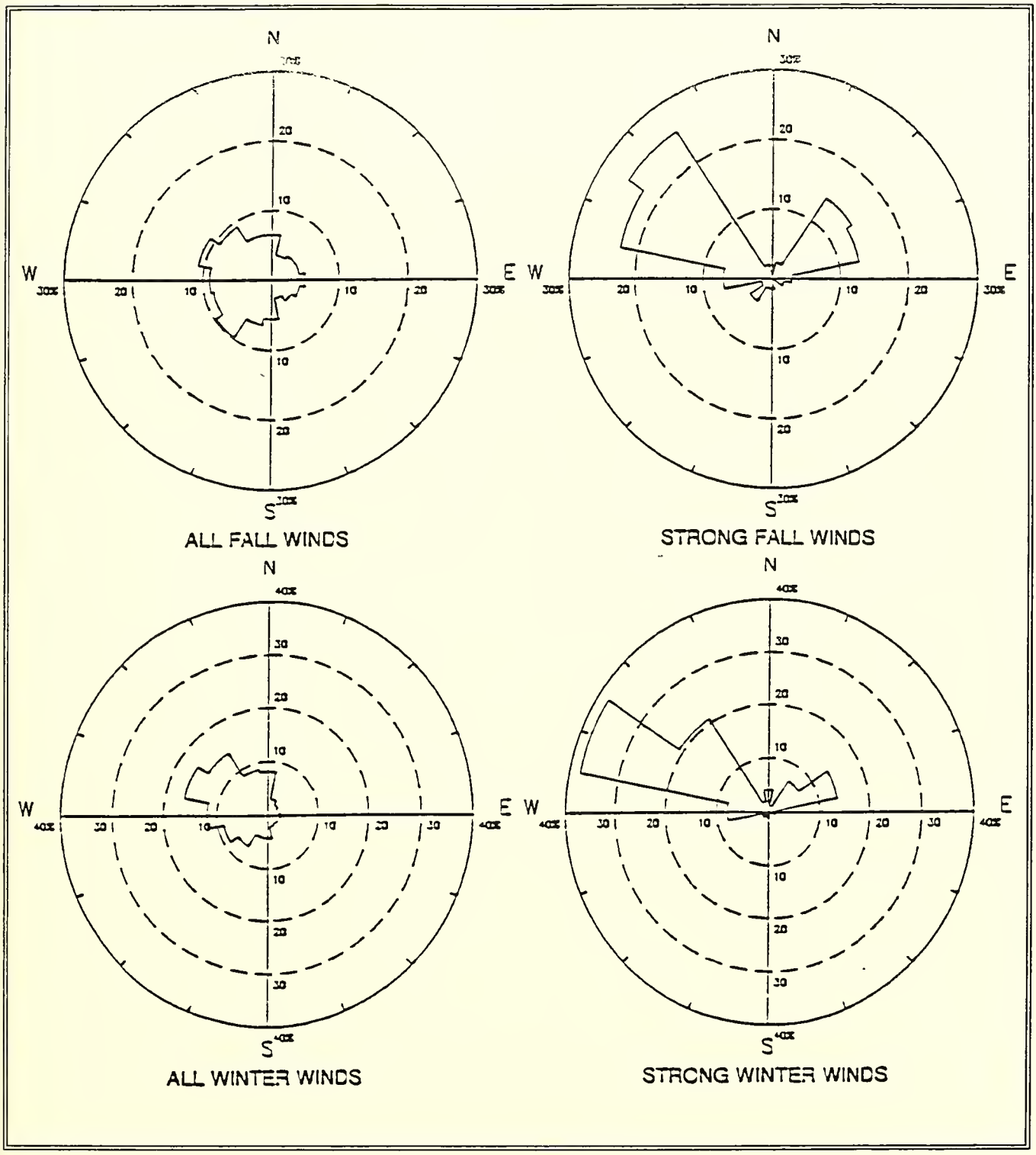
Exhibit 5 - 3



Directional Distribution of Spring and Summer Winds

Prepared By:
Rowan Williams Davies & Irwin, Inc.

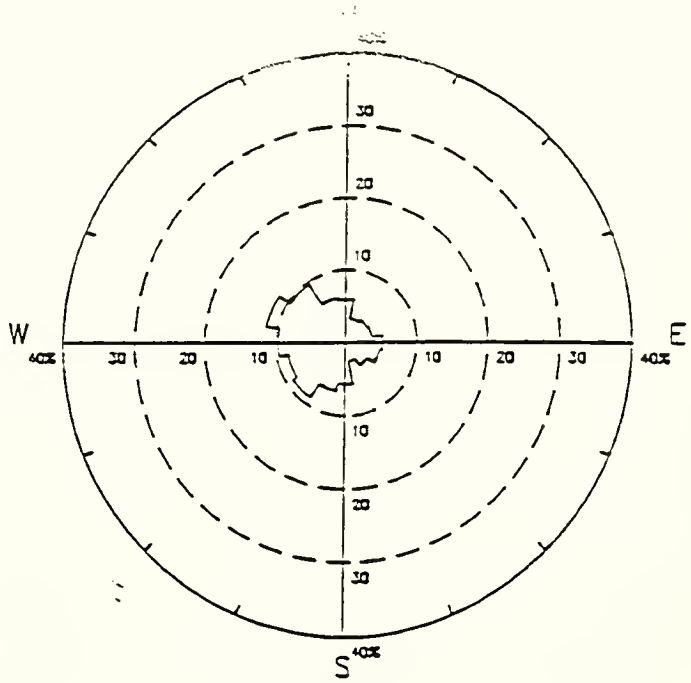
Exhibit 5 - 4



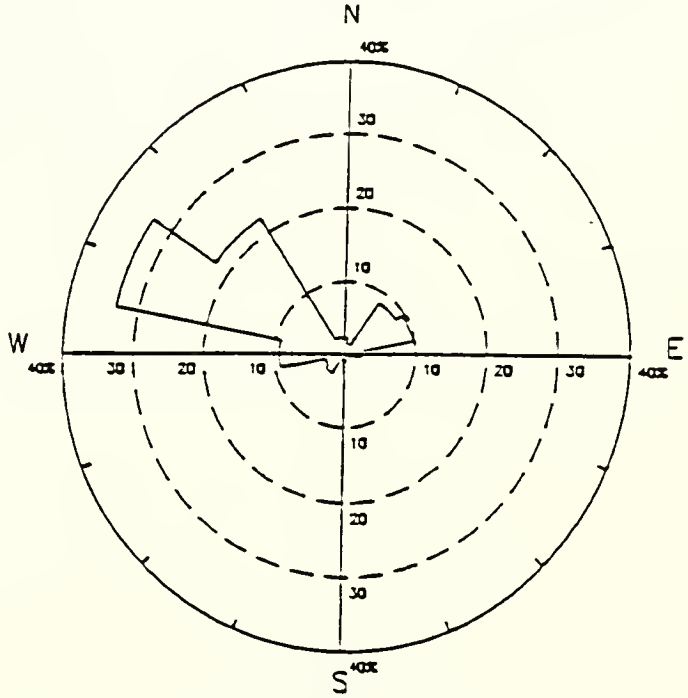
Directional Distribution of Fall and Winter Winds

Prepared By:
Rowan Williams Davies & Irwin, Inc.

Exhibit 5 - 5



ALL ANNUAL WINDS

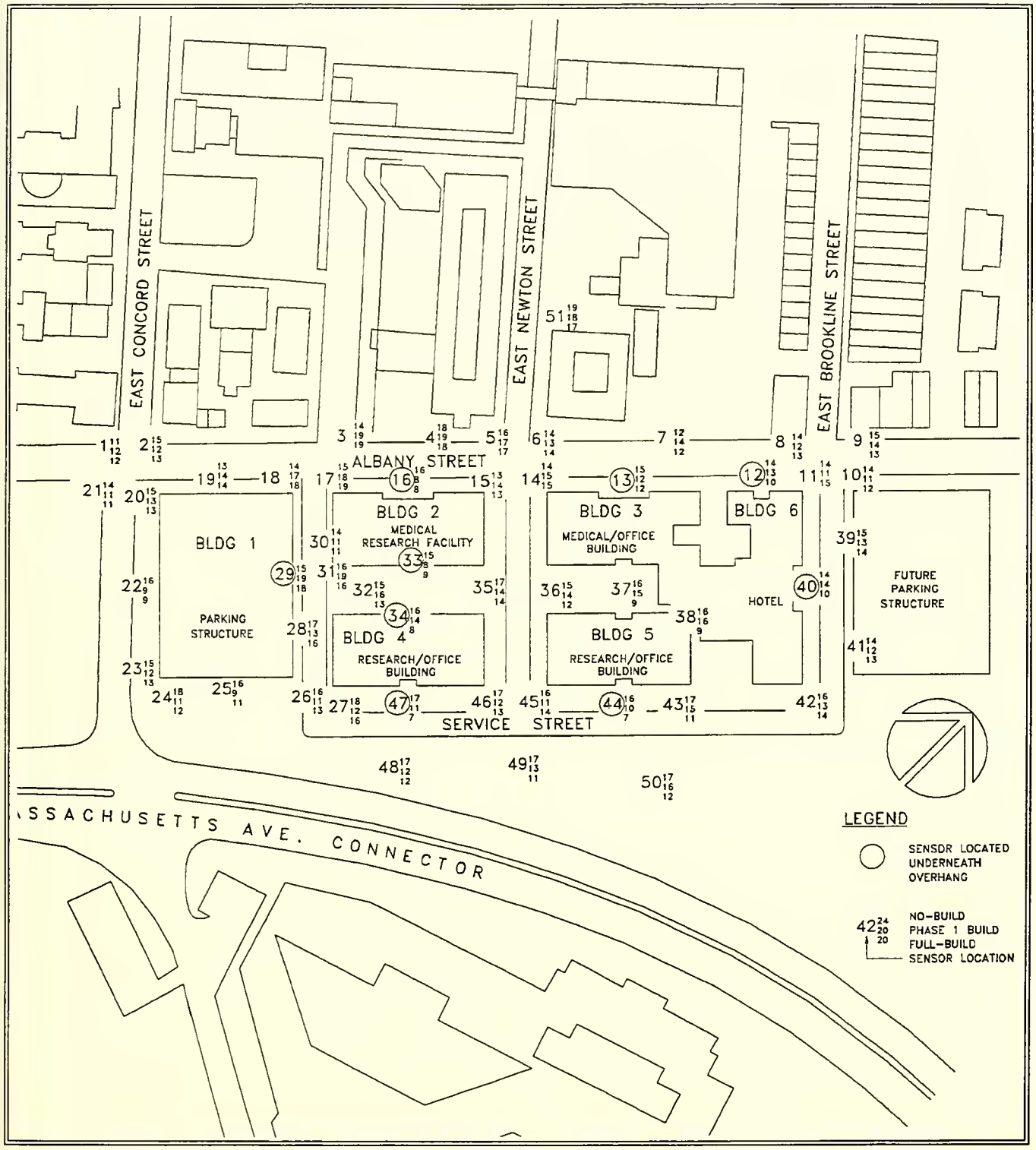


STRONG ANNUAL WINDS

Directional Distribution of Annual Winds

Prepared By:
Rowan Williams Davies & Irwin, Inc.

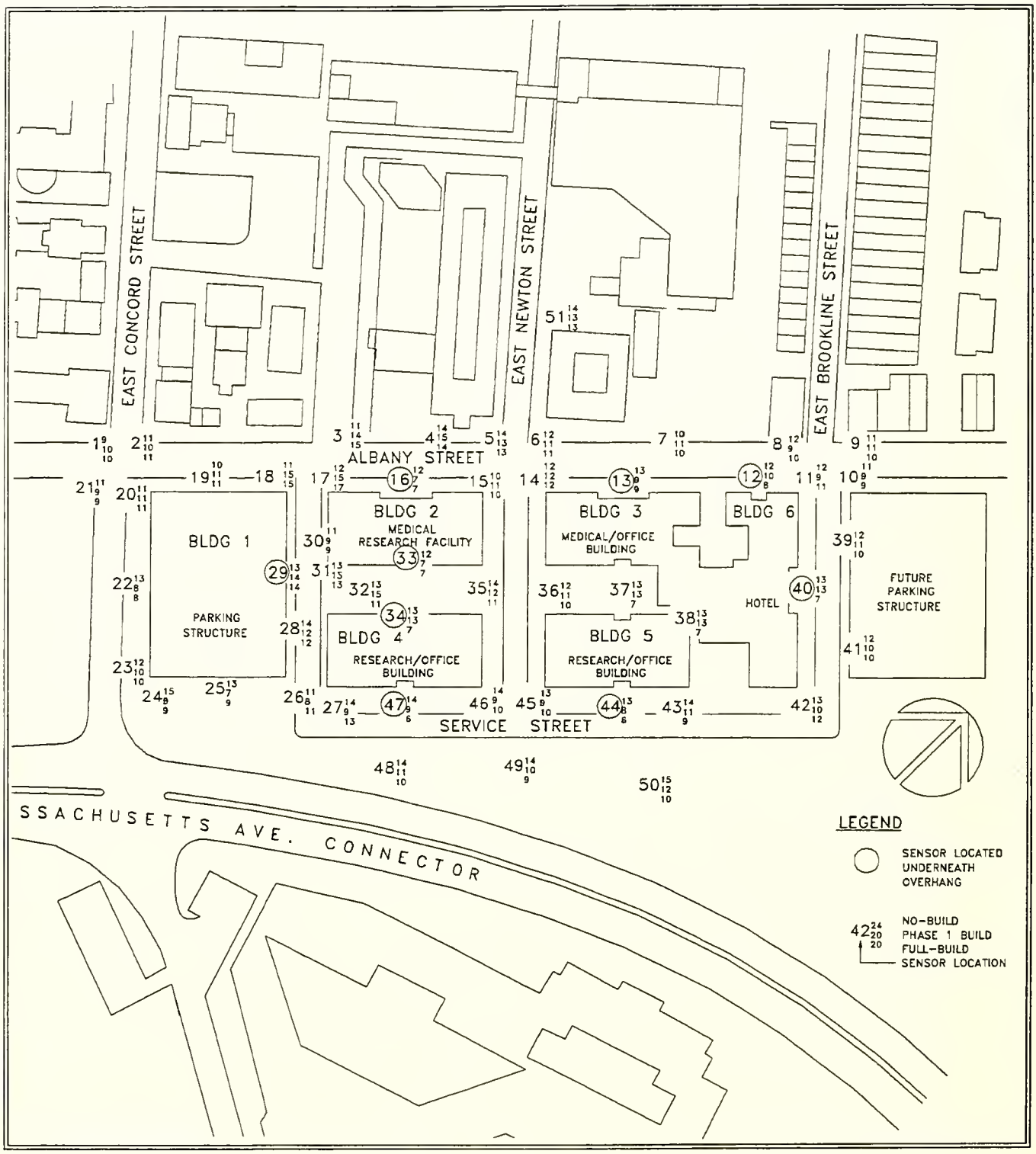
Exhibit 5 - 6



Pedestrian Level Mean Wind Speeds - Spring

Prepared By:
Rowan Williams Davies & Irwin, Inc.

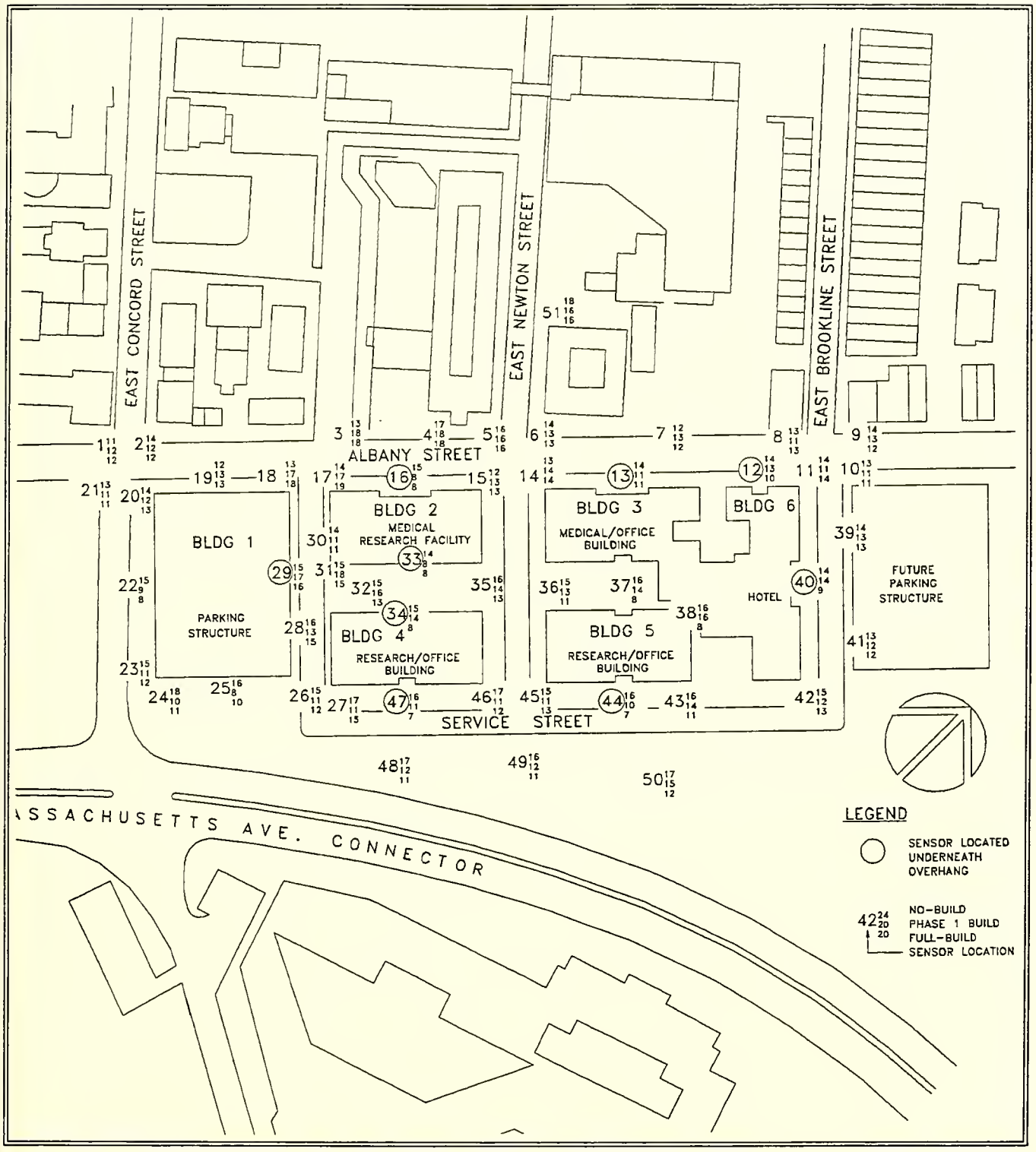
Exhibit 5 - 7



Pedestrian Level Mean Wind Speeds - Summer

Prepared By:
Rowan Williams Davies & Irwin, Inc.

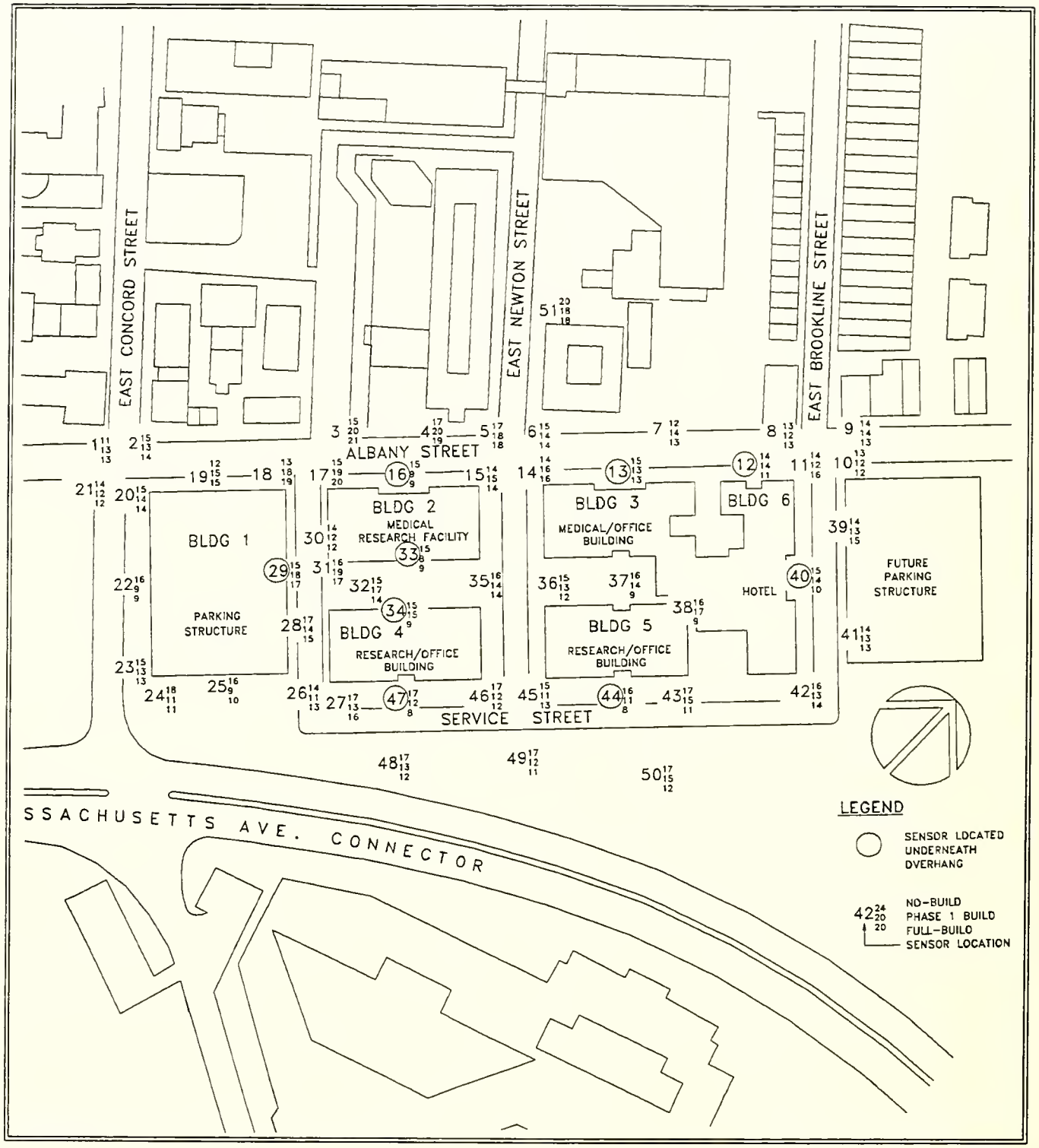
Exhibit 5 - 8



Pedestrian Level Mean Wind Speeds - Fall

Prepared By:
Rowan Williams Davies & Irwin, Inc.

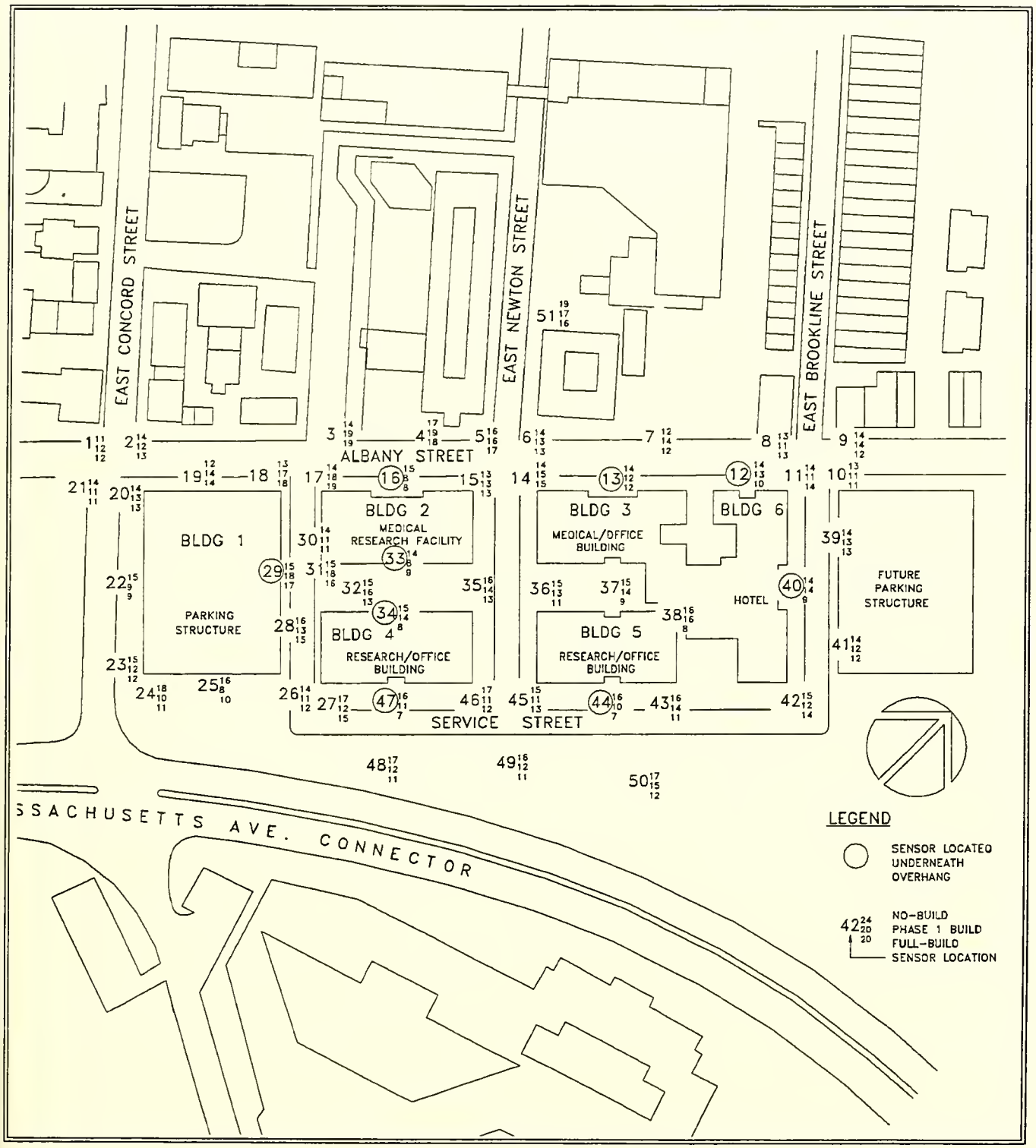
Exhibit 5 - 9



Pedestrian Level Mean Wind Speeds - Winter

Prepared By:
Rowan Williams Davies & Irwin, Inc.

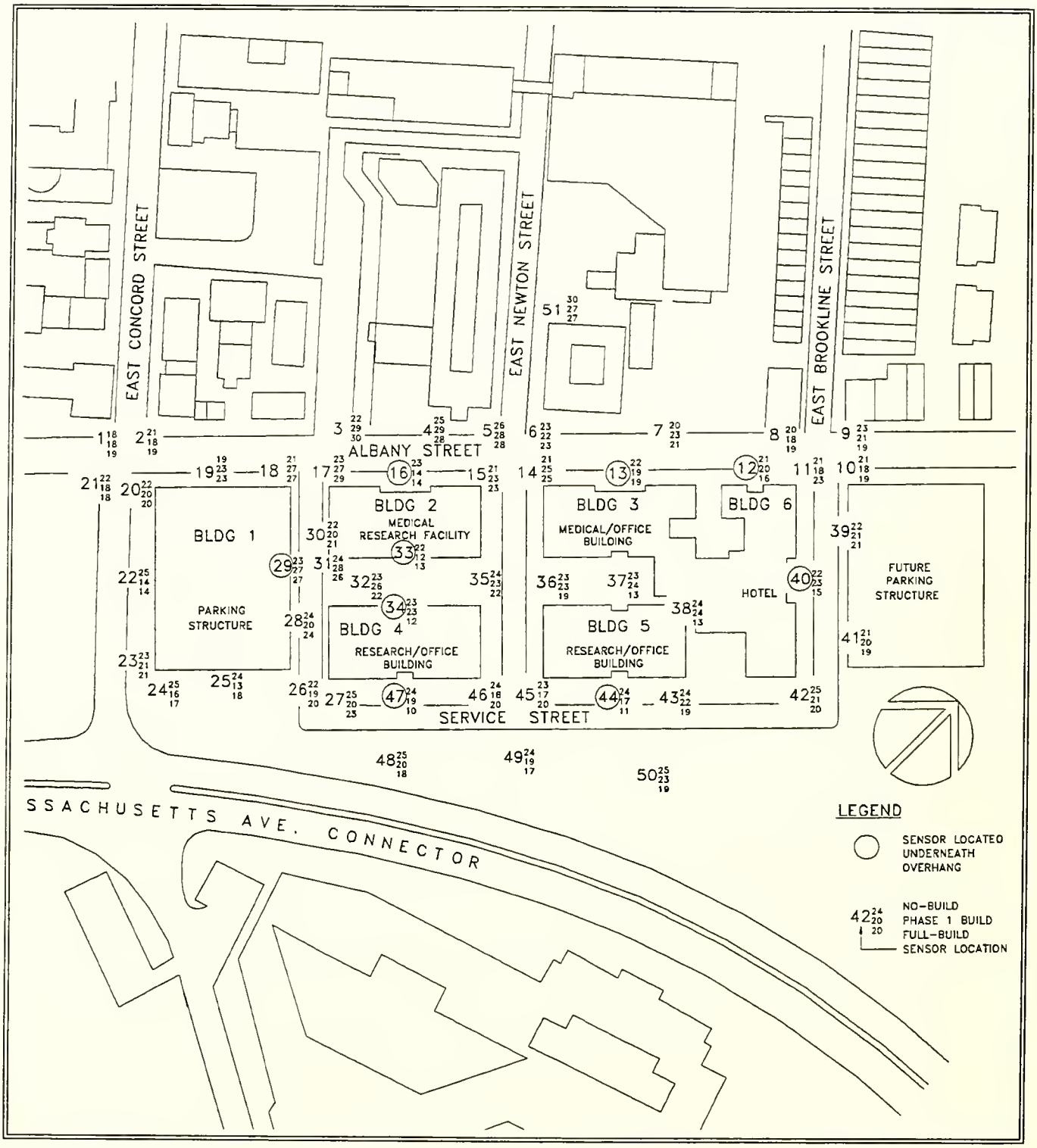
Exhibit 5 - 10



Pedestrian Level Mean Wind Speeds - Annual

Prepared By:
Rowan Williams Davies & Irwin, Inc.

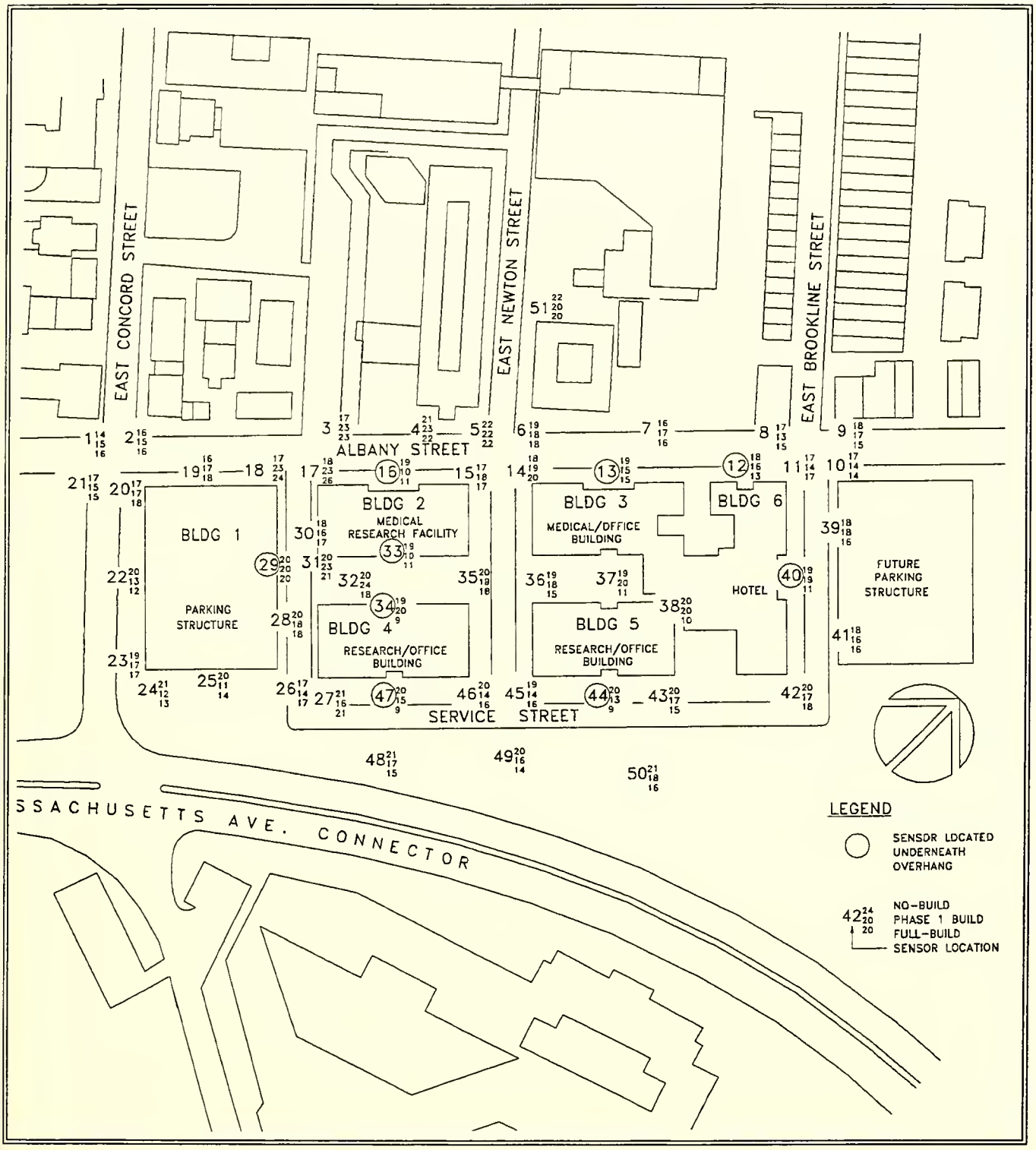
Exhibit 5 - 11



Pedestrian Level Effective Gust Spring

Prepared By:
Rowan Williams Davies & Irwin, Inc.

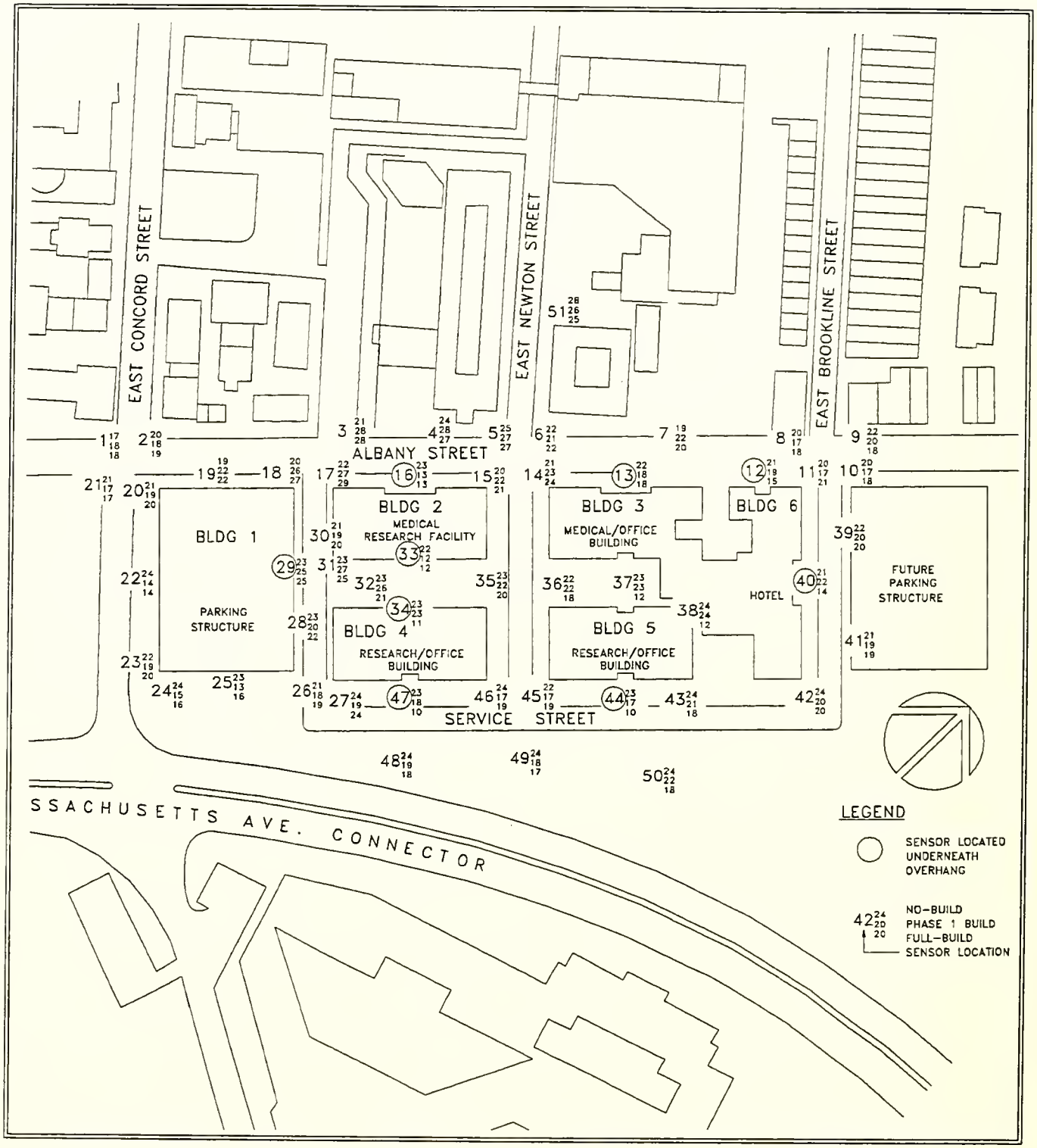
Exhibit 5 - 12



Pedestrian Level Effective Gust Summer

Prepared By:
Rowan Williams Davies & Irwin, Inc.

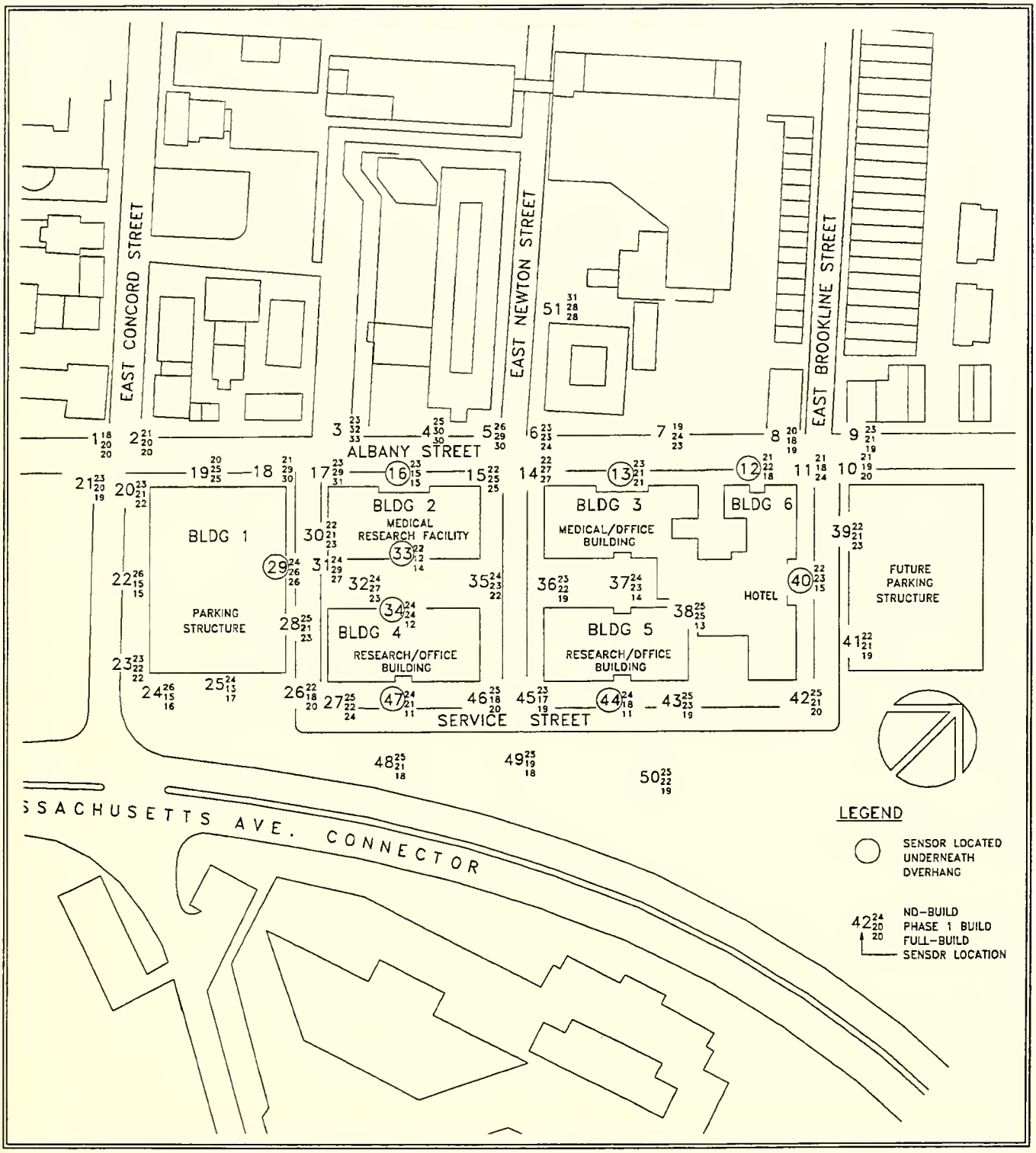
Exhibit 5 - 13



Pedestrian Level Effective Gust Fall

Prepared By:
Rowan Williams Davies & Irwin, Inc.

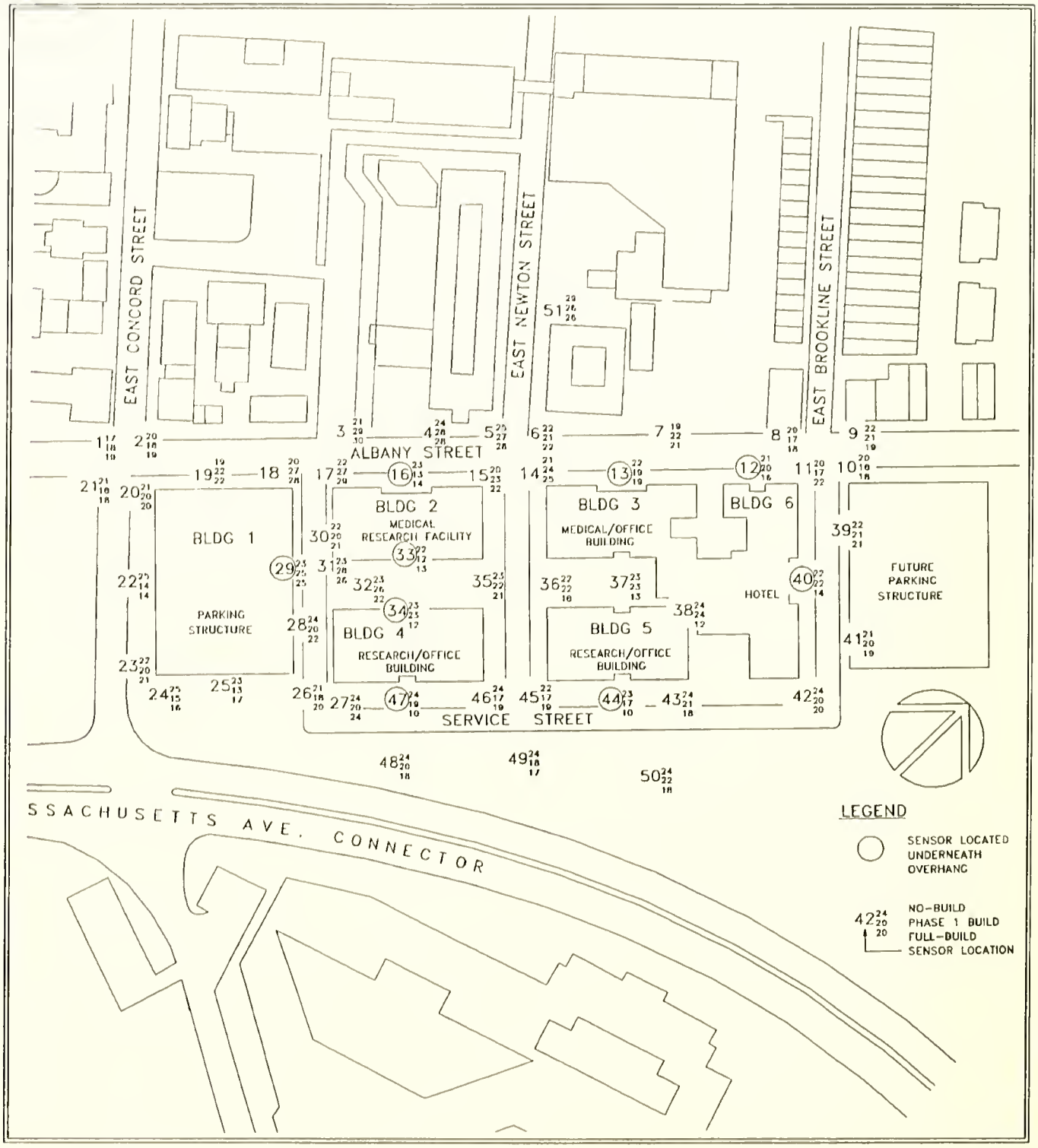
Exhibit 5 - 14



Pedestrian Level Effective Gust Winter

Prepared By:
Rowan Williams Davies & Irwin, Inc.

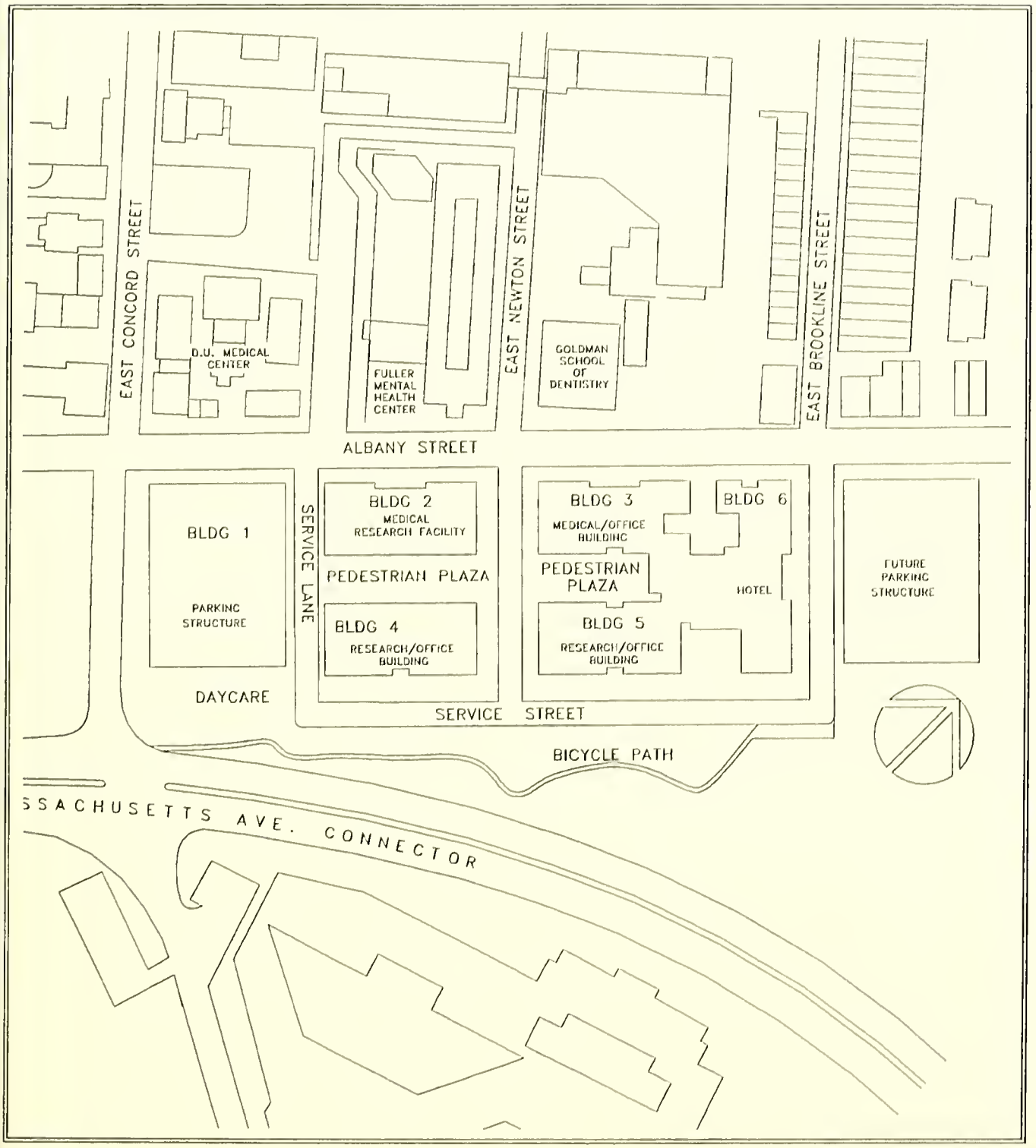
Exhibit 5 - 15



Pedestrian Level Effective Gust Annual

Prepared By:
Rowan Williams Davies & Irwin, Inc.

Exhibit 5 - 16



Orientation Plan of Study Area

Prepared By:
Rowan Williams Davies & Irwin, Inc.

Exhibit 5 - 17

6.0 TRANSPORTATION

6.0 TRANSPORTATION

6.1 INTRODUCTION

This section of the FPIR has been prepared to serve as a stand-alone report. As a result, some of the introductory materials are repetitive. This chapter discusses the transportation impacts of the proposed University Associates development on Albany Street in Boston, Massachusetts. Analyses were performed for existing and future conditions (Year 2000) to estimate the project's impacts in terms of vehicle, transit, and pedestrian trips as well as parking. Analyses for the forecast year were conducted for No-Build and Build conditions. In both cases, other projects which are expected to be completed by the Year 2000 have been included in the assessment of future conditions. This includes the completion of the Central Artery/Tunnel (CA/T) project. The work described herein is based on an adequacy determination for the Draft Project Impact Report made by the Boston Redevelopment Authority (BRA)[1].

6.1.1 THE UNIVERSITY ASSOCIATES SITE

The University Associates development site is located on Albany Street in the South End neighborhood of Boston, Massachusetts. It is currently occupied by a surface parking lot which is used by University Hospital, Boston City Hospital, and Boston University Medical Center. The site is bounded by Albany Street to the north, the Massachusetts Avenue Connector to/from the Southeast Expressway to the south, the Boston City Hospital chiller plant to the west, and the Flower Market to the east.

6.1.2 THE UNIVERSITY ASSOCIATES DEVELOPMENT PROPOSAL

The University Associates development proposal includes the construction of a first class medical office and research complex to replace existing obsolete facilities at Boston University Medical Center as well as at The University Hospital, and for the expansion of the growing research enterprises of area institutions. Uses planned for the site include medical offices, research, commercial offices, retail, hotel,

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[1] The precursor to this document was originally prepared as a Draft Environmental Impact Report (EIR)/Project Impact Report and as such was also subject to a scoping determination made by the Massachusetts Environmental Policy Act (MEPA) Unit of the Executive Office of Environmental Affairs. The Final EIR was filed in August 1991.

restaurant, day care and parking. Table 6-1 summarizes the development program as proposed in the Project Notification Form.[2]

Table 6 - 1
UNIVERSITY ASSOCIATES PROPOSED DEVELOPMENT PROGRAM

Type of Use	Proposed Size*
Medical Office	100,000
Research	360,000
General Office	200,000
Retail	20,000
Day-Care	10,000
Subtotal	690,000
Hotel	250 Rooms
Restaurant	180 Seats
Parking	1,265 Spaces**

*Square feet.
**Net new spaces (see Table 6-19).

Source: University Associates

6.1.3 STUDY AREA

The study area for this project is generally bounded by Dorchester Avenue to the east, Washington Street to the west, East Berkeley Street to the north, and Massachusetts Avenue to the south. Twelve intersections have been designated as analysis locations to measure the traffic impacts of the project. These intersections, the study area boundary, and the site location are illustrated in Exhibit 6-1.[3]

[2] Since that document was prepared, the program has been revised. The current development is slightly smaller in total square footage than the program analyzed for transportation impacts. Therefore, the transportation analysis is somewhat conservative, meaning that the actual impacts will be less than what has been projected.

[3] It should be noted that for the purposes of the transportation analysis, Albany Street is described as a north-south street and the intersecting streets are described as running in an east-west direction.

UNIVERSITY ASSOCIATES

Study Area and Traffic Analysis Locations

Exhibit 6 - 1

Prepared by:
Vanasse Hangen Brustlin, Inc.

NOVEMBER 1991

6.1.4 STUDY METHODOLOGY

This transportation study was conducted in three distinct phases. Phase I involved an inventory of existing conditions and travel demand characteristics in the area. The inventory included researching previous transportation reports as well as conducting new observations of area travel demands. New observations of traffic and pedestrian volumes were conducted in December 1990. Pedestrian counts were conducted during the morning, midday, and evening peak periods at several crosswalk and walkway locations adjacent to the site. Data collected during the inventory phase were assembled and used to define the existing transportation network as a base condition for subsequent analyses.

Phase II of the study built upon the data base assembled in Phase I and established the framework for evaluating the transportation impacts of the proposed project. In this phase, specific travel demand forecasts for the project were assessed along with future demand projected to be created by other area development and traffic volume shifts expected as a result of the reconstructed Central Artery. Estimates were made for three travel modes: automobile, transit, and pedestrian. The Year 2000 was selected as the analysis year based on the projected occupancy of the full project, which will be constructed in phases.

Phase III, the final study phase, included evaluation of the impacts of the project on the transportation system, identification of measures to mitigate impacts, and development of a monitoring program. Since the completion of the Draft PIR in May 1991, several additional analyses have been performed to respond to comments raised through the MEPA process and to comments raised by the BRA and BTD (see the Response to Comments section of the Final Project Impact Report).

6.1.5 SUMMARY OF FINDINGS

On a daily basis at Full-Build, the project is expected to generate a total of approximately 4,700 new daily vehicle trips. Approximately 450 of these trips are expected to occur in both the morning and evening peak hours. Twelve intersections (six signalized and six unsignalized) in the vicinity of the project site were analyzed for traffic impacts. Because of both regional and local traffic improvements resulting from the CA/T project, the addition of project traffic in the Year 2000 will have a relatively minor impact on levels of service and delay in comparison with Existing and No-Build conditions without the implementation of mitigation measures. With several additional access and control improvements resulting from proposed mitigation strategies, these minor impacts are largely alleviated. This finding is based on the dramatic improvements in traffic conditions

resulting from the construction of the CA/T project as well as the following mitigation measures:

- Extending East Concord Street from Albany Street to the reconstructed Massachusetts Avenue Connector[4]
- Signalizing the intersection of Albany Street and East Concord Street
- Signalizing the intersection of Albany Street and East Brookline Street

The project will create a new demand for approximately 1,265 (983 long-term and 282 short-term) parking spaces. All new parking demand will be met on-site in facilities proposed as part of this development as well as in adjacent parking areas.

The project is expected to generate approximately 1,880 daily transit trips. Approximately 272 inbound transit trips are projected for the morning peak hour, and 260 outbound transit trips are projected for the evening peak hour. Because the area is served by five MBTA bus routes plus two hospital shuttles providing connections to both the MBTA Red and Orange Lines, the impacts on any one mode of transit service will be small.

The mitigation strategies identified for this development include the physical roadway improvements identified above, demand reduction strategies, construction management measures, and other strategies aimed at properly managing the development and the area transportation system.

6.2 EXISTING CONDITIONS

6.2.1 TRAFFIC

The following inventory of roadway characteristics, intersection geometry and operating conditions, traffic volumes, and levels of service was compiled as part of the Phase I data collection process.

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[4] The East Concord Street Extension will be designed in a manner so as to prohibit motorists from entering the Extension from existing East Concord Street or from Albany Street, as was requested by neighborhood residents.

Roadway Network

Major roadways providing access to the study area include:

- The Central Artery (I-93) from the north
- The Southeast Expressway (I-93) from the south
- The Massachusetts Turnpike (I-90) from the west
- Massachusetts Avenue from the east and west
- Southampton Street from the east
- Albany Street from the north
- Melnea Cass Boulevard from the southwest

Many one-way streets exist in the study area. Exhibit 6-2 illustrates the existing roadway circulation pattern.

Traffic Volumes

Existing traffic volumes were counted manually and mechanically at key locations in the study area in December 1990. Automatic traffic recorders were placed on roadway links in the study area, and manual turning movement counts were conducted at three analysis intersections during the morning (7:30 AM to 9:00 AM) and evening (4:30 PM to 6:00 PM) peak periods. Traffic volumes were supplemented by earlier counts done in 1987 and 1988 at all analysis locations. Adjustments were made to update earlier counts based on the December 1990 counts.[5] Peak hour traffic volumes are shown in Exhibits 6-3 and 6-4. A comment

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[5] The rationale for this approach is as follows:
The South End Master Plan Study, completed in 1988, contains extensive traffic volumes and analyses from that year. In 1988, VHB also collected preliminary traffic volume data for the University Associates development and for a parking study at Boston City Hospital.

In 1990, VHB placed automatic traffic recorders on Massachusetts Avenue and on Albany Street. In addition, VHB conducted peak period intersection turning movement counts along Albany Street in the vicinity of the site. The results of the 1990 count program indicated that traffic volumes had actually declined in several locations.

Sewer repair work has been taking place along portions of Albany Street in the vicinity of Malden Street and East Berkeley Street. In addition, a portion of Harrison Avenue south of Massachusetts Avenue is closed due to construction. It was concluded that due to these construction activities and street closures, the counts of existing traffic volumes would not reflect

was raised relative to the discontinuity of traffic volumes on the traffic networks in the link between the Malden Street/Albany Street and East Brookline Street/Albany Street intersections. The reason for this discontinuity is that four streets as well as the large Boston Flower Exchange parking lot intersect Albany Street between these two intersections.

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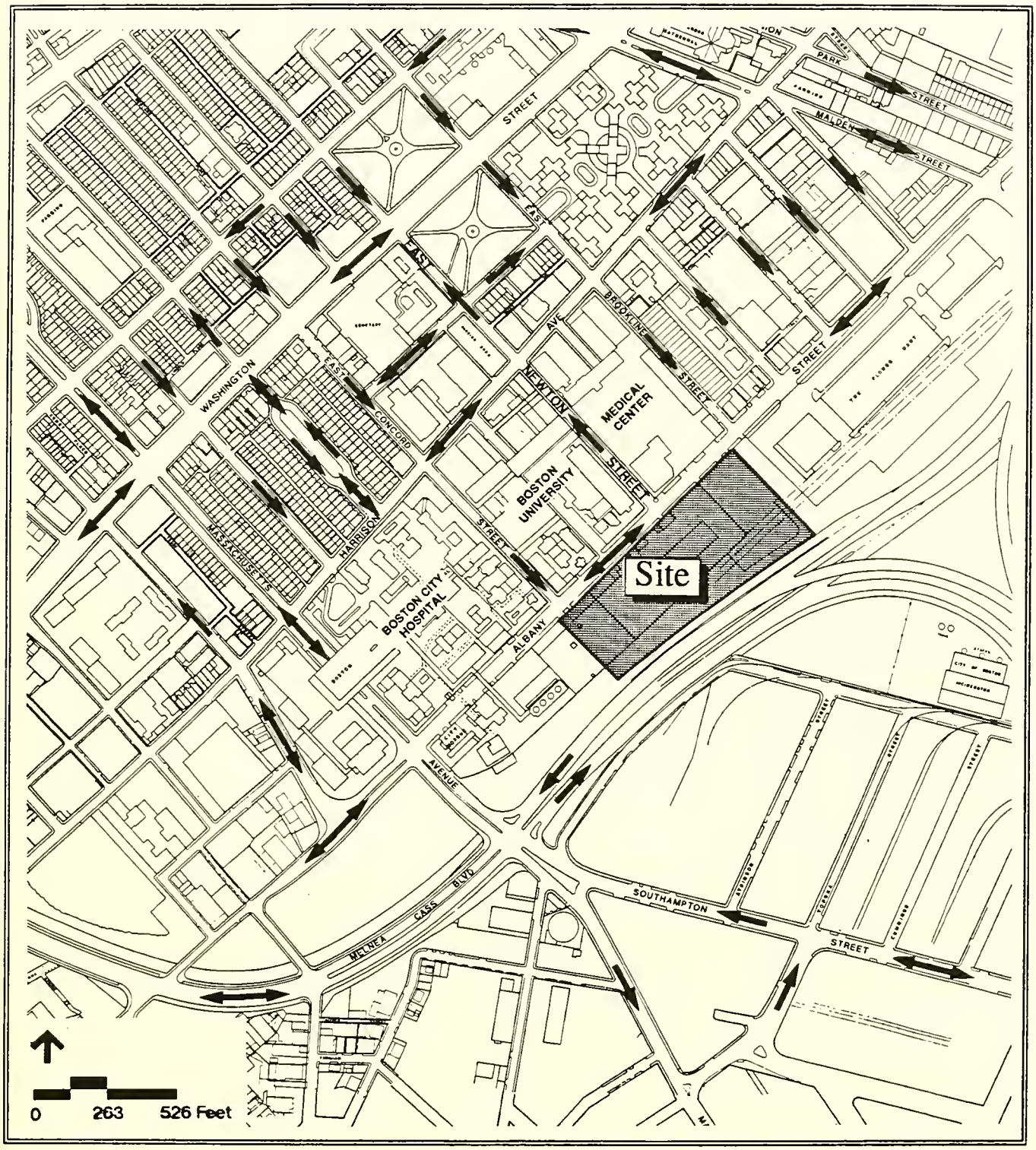
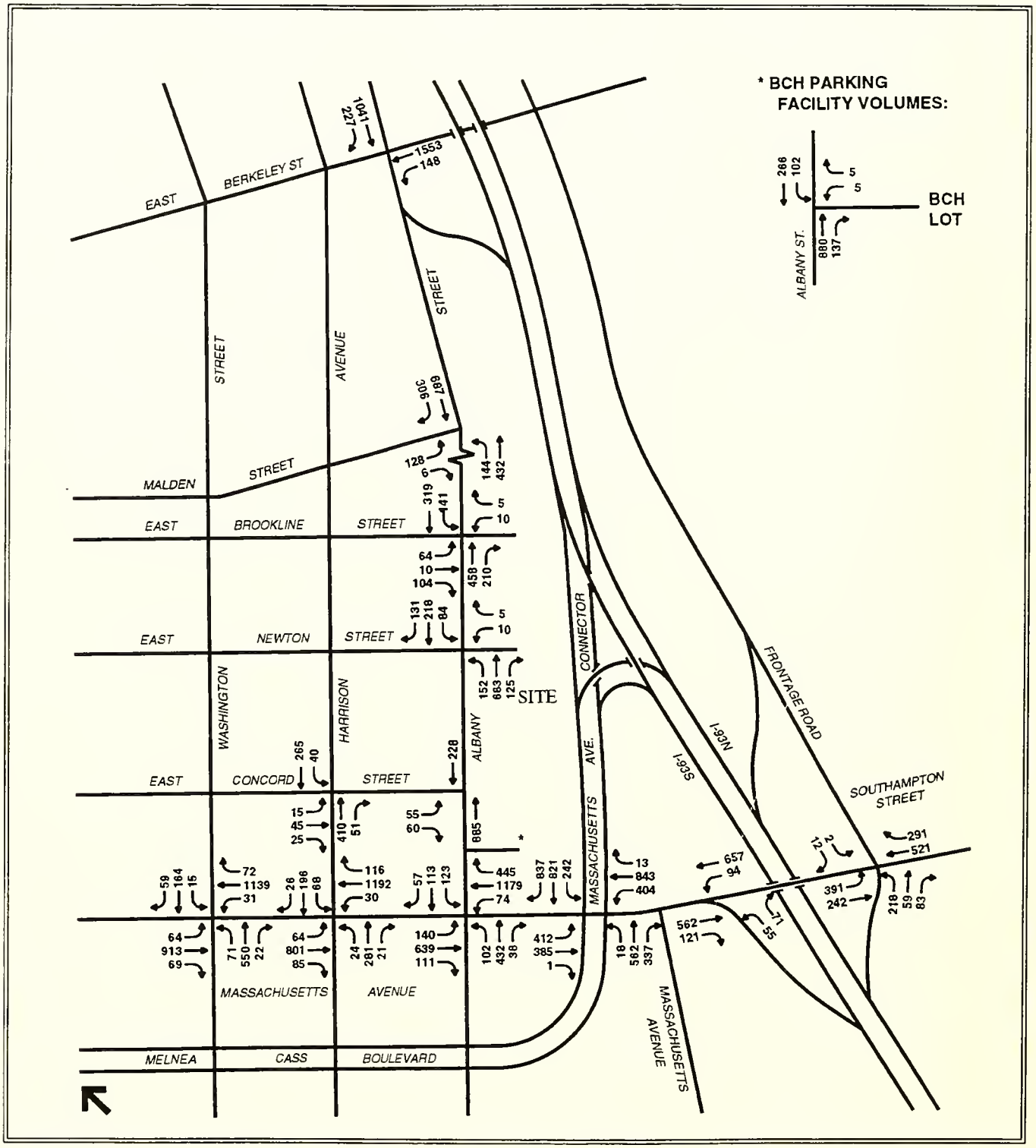
typical conditions when there are no traffic diversions due to construction activity. Therefore, the previously collected data represent the best available source of existing traffic volumes.



Existing Roadway Circulation

Prepared By:
Vanasse Hangen Brustlin, Inc.

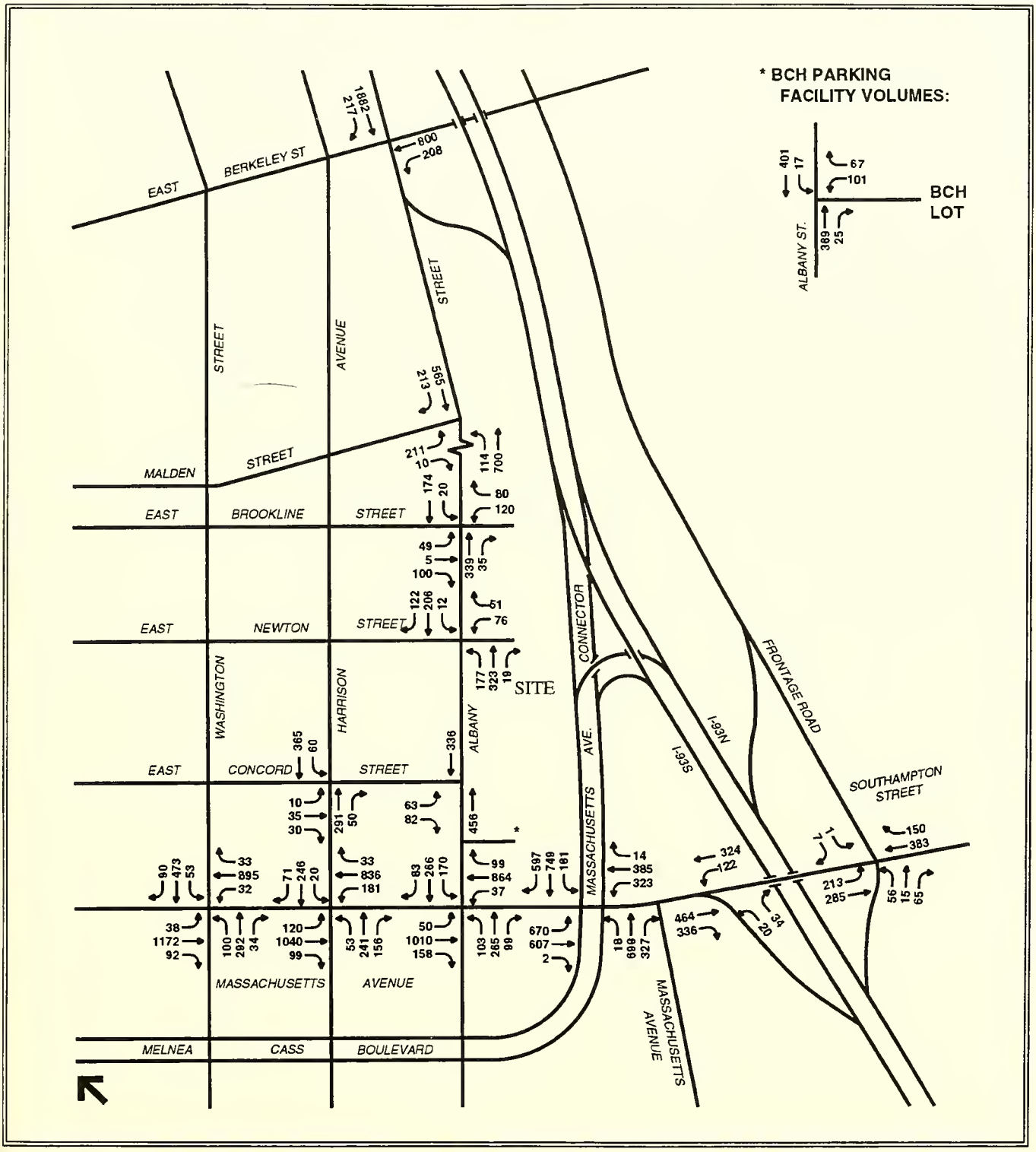
Exhibit 6 - 2



Existing Morning Peak Hour Traffic Volumes

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 3



Existing Evening Peak Hour Traffic Volumes

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 4

Level-of-Service Analysis

To assess the ability of an intersection to process traffic, an existing conditions operations analysis was performed. To measure the quality of traffic operation, twelve intersections within the study area were analyzed with regard to capacity and delay. These intersections were specified in the scope issued by MEPA and the Boston Transportation Department (BTD).

A primary result of capacity analysis is the assignment of levels of service to transportation facilities under various traffic flow conditions. The concept of level of service is defined as a qualitative measure describing operating conditions within a traffic stream and their perception by motorists. A level-of-service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. In so doing, it provides an index to the quality of traffic flow.

Signalized Intersection Level-of-Service Analysis Procedure

Levels of service for signalized intersections are calculated using the operational analysis methodology of the 1985 Highway Capacity Manual (HCM).[6] This method assesses the effects of signal type, timing, phasing, progression, vehicle mix, and geometrics on delay. Level-of-service designations are based solely on the criterion of average stopped delay per vehicle, since delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Table 6-2 summarizes the relationship between level of service and delay. The tabulated delay criteria may be applied in assigning level-of-service designations to individual lane groups, intersection approaches, or to entire intersections. Throughout this chapter, delays and level of service are reported for entire intersections.

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[6] Highway Capacity Manual, Special Report 209; Transportation Research Board, Washington, DC (1985).

Table 6 - 2
LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service	
A	≤5.0
B	5.1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.1 to 60.0
F	>60.0

Source: Highway Capacity Manual, Special Report 209; Transportation Research Board; Washington, DC (1985).

These calculated delays cannot be directly related to intersection capacity. It is possible to have delays in the level-of-service F range without exceeding capacity. This is possible if one or more of the following conditions exist:

- Long signal cycle lengths
- A particular traffic movement experiences a long red time
- Progressive movement for a particular lane group is poor

For the reasons stated above, both capacity and level of service must be carefully examined when analyzing a signalized intersection. The designation of an approach as operating at LOS F does not automatically imply that the entire intersection, approach, or lane group, is overloaded, nor does a level of service in the A to E range automatically indicate that there is unused capacity available. As required by the EIR guidelines issued jointly by the Secretary of Transportation and Construction and the Secretary of Environmental Affairs, level-of-service analyses for signalized intersections were conducted using a computer program (CINCH)[7] based on the 1985 Highway Capacity Manual. Detailed analysis results are presented in Appendix F.

Ideal Saturation Flow Rate. The Highway Capacity Manual assumes that 1,800 vehicles per lane per hour of green time can pass through an intersection under "ideal" (meaning highest capacity) conditions. Field observations conducted at

[7] The Capacity of Intersections: CTPS's HCM Software (CINCH); Boston: Central Transportation Planning Staff (1987).

Boston-area urban locations concluded that the actual saturation flow is approximately 1,950 vehicles per hour. Nevertheless, in deference to the MEPA guidelines for EIRs, 1,800 was used routinely in this PIR, except at one intersection where field observations required an adjustment. At Massachusetts Avenue and Albany Street, eastbound approach traffic on Massachusetts Avenue cannot use its available green time efficiently because of downstream queues at the intersection of Melnea Cass Boulevard and Massachusetts Avenue. For this reason, in the analysis of the Massachusetts Avenue and Albany Street intersection, the saturation flow rate of all moves which are affected by these queues was decreased to 1,500 vehicles per hour of green time per lane (vphgpl).

Signalized Intersection Level-of-Service Results

Level-of-service analyses for morning and evening peak-hour traffic operations were conducted for the six signalized intersections in the study area. Table 6-3 summarizes the results of the analysis.

As indicated in Table 6-3, traffic operations at all six of the signalized intersections operate at acceptable levels of service (LOS D or better) during the morning peak hour. Three of the six signalized intersections operate at acceptable levels of service during the evening peak hour. The three intersections which currently operate at deficient levels of service during the evening peak hour are:

- Albany Street and East Berkeley Street
- Massachusetts Avenue and Albany Street
- Massachusetts Avenue and Melnea Cass Boulevard

These intersections operate at deficient levels of service due to a combination of high traffic volumes and improper signal phasing and timing. The intersection of Massachusetts Avenue and Albany Street operates at level-of-service E primarily due to the downstream queues from the eastbound approach to the intersection of Massachusetts Avenue and Melnea Cass Boulevard. Eastbound vehicles approaching Melnea Cass Boulevard often form a queue which blocks the Massachusetts Avenue and Albany Street intersection. This significantly restricts the ability of motorists to proceed through the Massachusetts Avenue and Albany Street intersection and, therefore, reduces the level of service. Possible measures to improve the level of service at these intersections are discussed later in this chapter.

Unsignalized Intersection Level-of-Service Analysis Procedures

Level of service for unsignalized intersections is determined by a procedure described in the 1985 Highway Capacity Manual. The procedure accounts for lane configurations on both the minor and major approaches, conflicting traffic stream volumes, and type of intersection control (STOP versus YIELD). First, using a gap analysis procedure, the maximum capacity (or possible flow of vehicles) for each minor approach lane is calculated. These capacities are then compared to the demands. The difference between available capacity and demand is defined as available reserve capacity (ARC) and is used as the criterion for determining level of service and estimating expected delay to minor street traffic. Table 6-4 summarizes the relationship between reserve capacity, level of service, and expected delay to minor street traffic.

Table 6 - 3
EXISTING LEVEL OF SERVICE - SIGNALIZED INTERSECTIONS

Location Number	Intersection	Morning Peak Hour V/C*	Morning Peak Hour Delay**	Morning Peak Hour LOS***	Evening Peak Hour V/C	Evening Peak Hour Delay	Evening Peak Hour LOS
1	Albany Street and East Berkeley Street	0.57	19	C	0.70	47	E
6	Harrison Avenue and E. Concord St.	0.38	6	B	0.29	5	B
7	Massachusetts Ave. and Washington Street	0.50	12	B	0.61	14	B
8	Massachusetts Ave. and Harrison Avenue	0.72	22	C	0.82	34	D
9	Massachusetts Ave. and Albany Street	0.80	33	D	0.84	48	E
10	Massachusetts Ave.	0.93	35	D	1.02	48	E

Volume-to-capacity ratio.
**Average stopped delay per vehicle in seconds.
***Level of service.
+Refer to Exhibit 6-1 for location of intersection.

Source: Vanasse Hangen Brustlin, Inc.

Unsignalized Intersection Level-of-Service Results

Level-of-service (LOS) analyses were performed at six unsignalized intersections in the study area. These include:

- Albany Street and Malden Street
- Albany Street and East Brookline Street
- Albany Street and East Newton Street
- Albany Street and East Concord Street
- Southampton Street and I-93 Southbound ramp
- Southampton Street and I-93 Northbound ramp

The results of these analyses are presented in Table 6-5.

Table 6 - 4
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Available Reserve Capacity (passenger cars per hour)	Level of Service	Expected Delay to Minor Street Traffic
400 or more	A	Little or no delay
300-399	B	Short traffic delays
200-299	C	Average traffic delays
100-199	D	Long traffic delays
0- 99	E	Very long traffic delays
*	F	Extreme Delays

*Demand volume exceeds capacity.

Source: Transportation Research Board; Special Report 209, Highway Capacity Manual; Washington, DC (1985).

During the morning peak hour, three unsignalized intersections operate at LOS D, one operates at LOS E, and two operate at LOS F. During the evening peak hour, five unsignalized intersections operate at LOS D or better, while one operates at LOS F. Although at LOS E motorists experience very long delays attempting to make the critical move through the intersection, it does not always indicate the need for improvements and does not compare with LOS E for signalized intersections. LOS F, which usually indicates the need for intersection improvements, was calculated for:

- Albany Street and Malden Street during both peak hours (left turns from Malden Street),
- Southampton Street and the I-93 Northbound ramp during the morning peak hour (left turns from the ramp).

6.2.2 PARKING

Analysis Area

A large supply of off-street and on-street parking is provided within the area of the proposed development. For the purpose of this study, the parking data presented includes all public on-street spaces within walking distance (approximately 1,500 feet) of Boston University Medical Center and Boston City Hospital and all of the off-street spaces controlled by both institutions. A total of 4,584 parking spaces are provided, including 3,695 off-street spaces and 889 on-street spaces.

Off-Street Parking Supply

Exhibit 6-5 shows the location, type and number of spaces in existing parking facilities controlled by the three institutions. Table 6-6 presents additional information about each facility. This information was obtained from the South End Medical Area Planning Study prepared by Howard/Stein-Hudson Associates.[8] As shown, there are 3,695 off-street parking spaces composed of 485 spaces open to the public and 3,210 spaces reserved for institutional employees.

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[8] South End Medical Area Planning Study, Phase 1 Report: Existing Transportation Conditions, Problems and Opportunities, Howard/Stein-Hudson Associates, August, 1988.

Table 6 - 5
EXISTING LEVEL OF SERVICE - UNSIGNALIZED INTERSECTIONS

Location Number	Intersection and Critical Movement	Morning Peak Hour ARC**	Morning Peak Hour LOS***	Evening Peak Hour ARC	Evening Peak Hour LOS
2	Albany Street and Malden Street:				
	Left turns from Malden Street	0	F	0	F
3	Albany Street and East Brookline Street:				
	Left turns from East Brookline Street	116	D	482	A
	Left turns from BUMC parking area	181	D	260	C
4	Albany Street and East Newton Street:				
	All moves from BUMC parking area	141	D	223	C
5	Albany Street and East Concord Street:				
	Left turns from East Concord Street	147	D	275	C
11	Southampton Street and I-93 Southbound ramps:				
	Left turns from I-93 Southbound ramp+	29	E	132	D
12	Southampton Street and I-93 Northbound ramp:				
	Left turns from I-93 Northbound ramp	0	F	174	D

*Refer to Exhibit 6-1 for location of intersection.
**Available reserve capacity.
***Level of service.
+The I-93 southbound ramp is two-way for a short distance to provide access to the Boston Science Center.

Source: Vanasse Hangen Brustlin, Inc.

Table 6 - 6
OFF-STREET PARKING SUPPLY

Map No.	Facility Name/Location	Insti-tution	Number of Spaces Public	Private +	Total
1	McCormack Tower Lot	BCH*		9	9
2	McCormack Tower Garage	BCH	100	430	530
3	Linda Richard Lot	BCH	50		50
4	D Lot	BUMC**		24	24
5	Talbot Lot	BUMC		50	50
6	Fuller Mental Health Lot	BUMC		6060	
7	DOB Garage	UH***	250		250
8	E. Brookline Street Lot	UH		25	25
9	BU Med. Center Lot	BUMC		80	80
10	Chiller Plant Lot	BCH		25	25
11	Morgue Lot	BCH		25	25
12	Albany Street Lot	BCH		841	841
13	A Lot	BUMC	85	541	626
14	C Lot	BUMC		1,100	1,100
	TOTAL		485	3,210	3,695

* Boston City Hospital.
** Boston University Medical Center.
***University Hospital.
\+ Open to institutional employees only.

Sources: South End Medical Area Planning Study, Howard/Stein-Hudson Associates, August 1988; Boston City Hospital, Comprehensive Parking Study, Vanasse Hangen Brustlin, Inc., May 1988; and Boston Transportation Department, Off-street Downtown Parking Inventory, 1987; Vanasse Hangen Brustlin, Inc., August 1991.

On-Street Parking Supply

Exhibit 6-6 presents the on-street parking supply in the vicinity of the site. As shown, there are a total of 889 on-street parking spaces. Of these, 224 are resident spaces, 73 are visitor spaces, 284 are metered spaces, 297 are unrestricted spaces, and 11 are handicapped spaces. Of these, 592 are potentially available to the institutions' population (metered, unrestricted and handicapped spaces). A detailed breakdown of the on-street parking supply is presented in Appendix F of the FPIR.

In the near future, significant changes to the parking supply are anticipated as a result of the CA/T project. Specific changes in the parking supply in the area of the development site are presented in the Probable Project Impacts section.

6.2.3 PUBLIC TRANSPORTATION

Although the project site is not directly served by rapid transit, a number of bus routes pass through the study area and by the site. A number of these bus routes provide connections between rapid transit stations and the study area. Exhibits 6-7 and 6-8 show the existing facilities and services in the area. This is shown in two illustrations for purposes of clarity. Public transportation services include two nearby rapid transit lines and local MBTA bus routes.

Rapid Transit

The MBTA's rapid transit Red Line passes through the study area and, with the Orange Line, is linked to the site via local bus routes and shuttle bus services run by Boston University Medical Center and Boston City Hospital.

Bus Service

The MBTA currently operates five bus routes that serve the project area. All five of these bus routes are local routes serving South Boston, Cambridge, Back Bay, and Downtown. These five bus routes are described below:

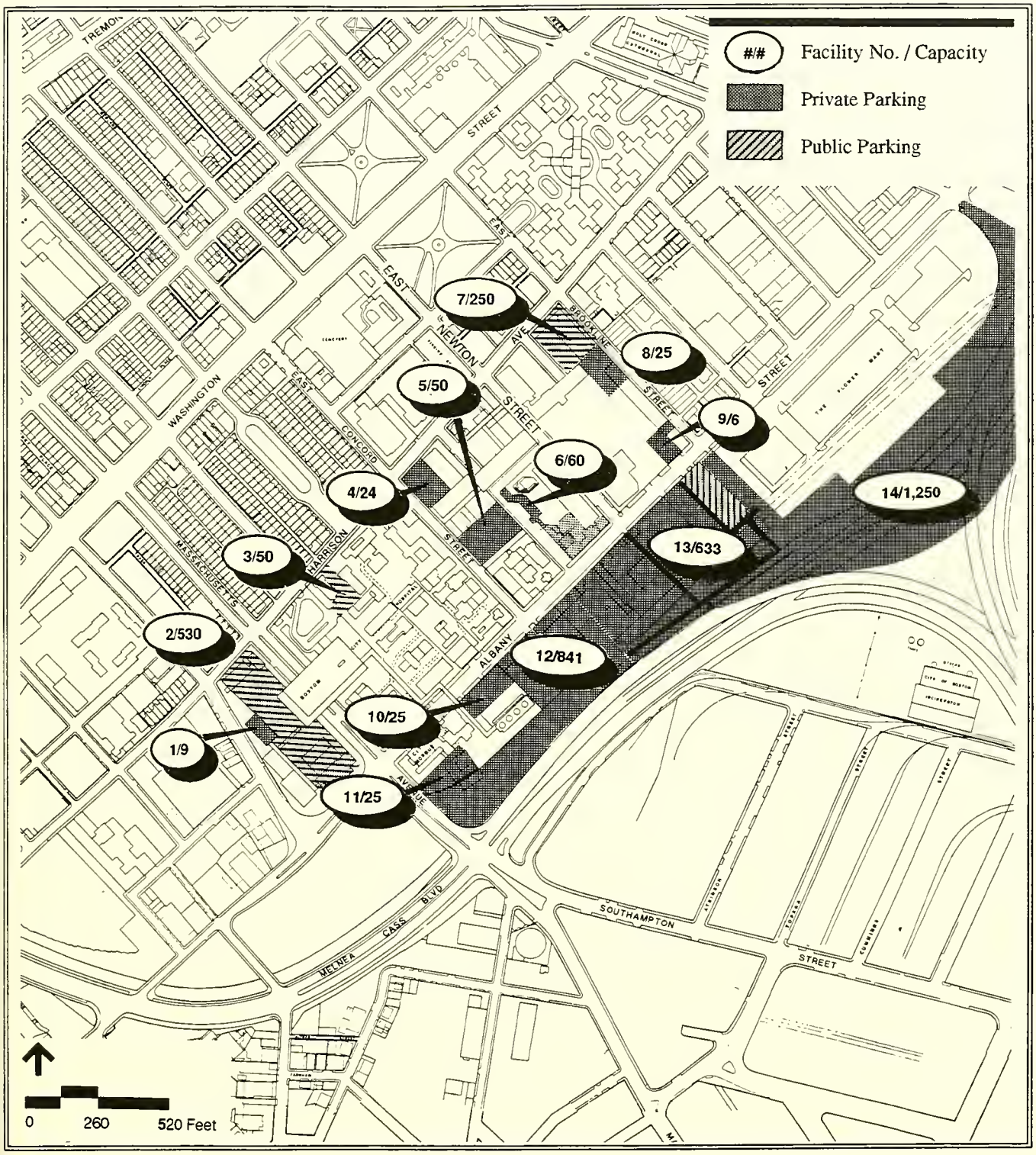
- Route 1 - Service directly along Massachusetts Avenue from Dudley Square (Roxbury) to Harvard Square (Cambridge)

- Route 8 - Service between Columbia Point (Dorchester) and Kenmore Square via Ruggles Station

- Route 10 - Service between City Point (South Boston) and Copley Square (Back Bay) along Albany Street, East Newton Street, Washington Street, and West Dedham Street

- Route 47 - Service between Andrew Station (Andrew Square) and Central Station (Central Square) in Cambridge

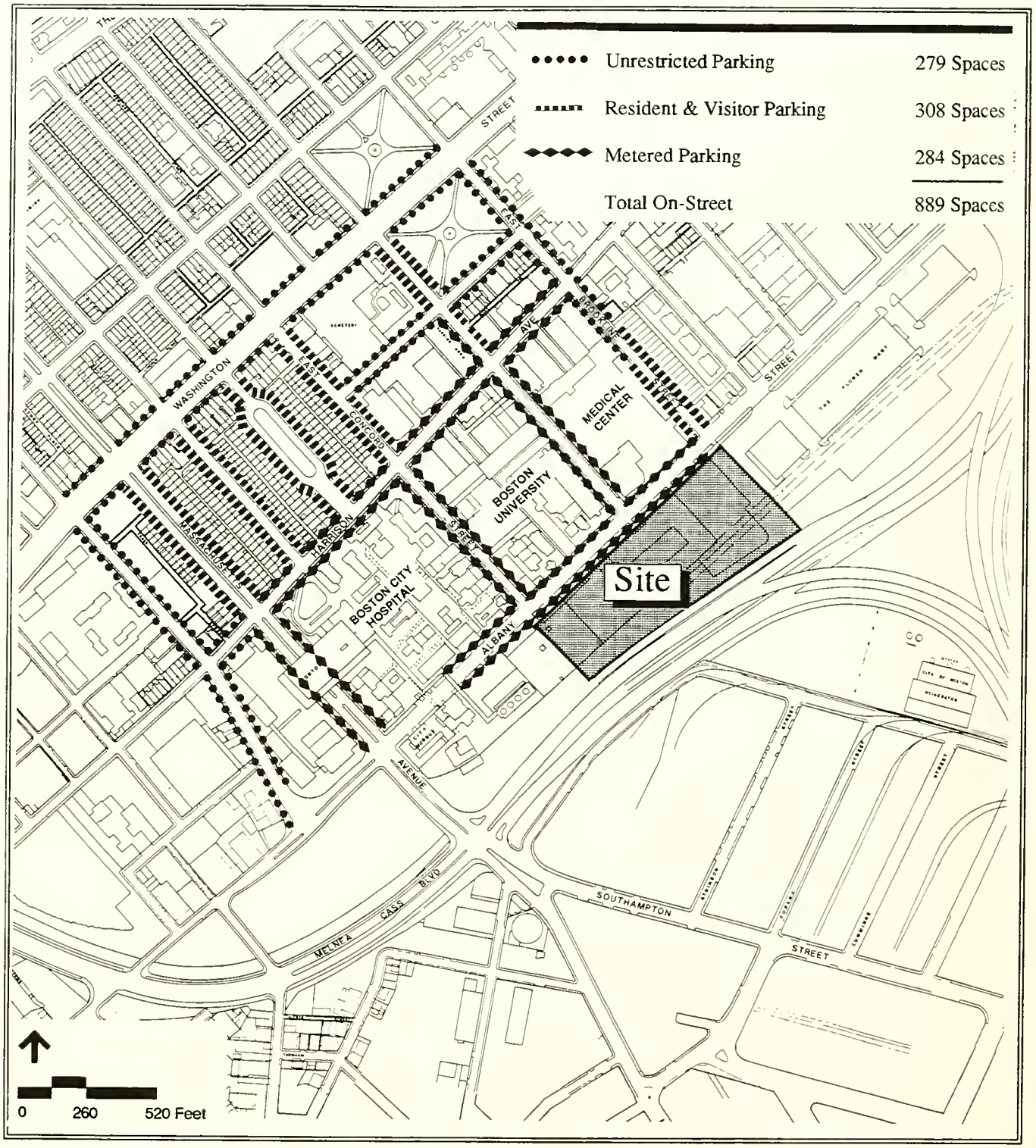
- Route 49 - Service along Washington Street between Dudley Square and Downtown



Existing Off-Street Parking Supply

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 5



Existing On-Street Parking Areas

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 6

The typical bus used on these routes has a seating capacity of 40 passengers. Its normal carrying capacity (used for service planning) is 60 passengers, although greater loads can be accommodated under crush conditions. Based on the scheduled headways, these bus routes have a total planning capacity of approximately 1,558 passengers per direction in the evening peak hour. Table 6-7 shows the bus routes, headways, and planning capacity.

Table 6 - 7
MBTA BUS ROUTES - EVENING PEAK HOUR

Route	Description	Scheduled Headway* (Minutes)	Average Buses/Hour	Scheduled Planning Capacity**
1	Dudley Square/ Harvard Square	7	8.6	514
8	Columbia Point/ Ruggles Station	30	2.0	120
10	City Point/Copley Sq.	25	2.4	144
47	Central Square/ Andrew Square	20	3.0	180
49	Dudley Square/ Downtown	6	10.0	600
	Total			1,558

*Spring 1990 Schedule.
**Planning Capacity is 60 Passengers

Source: Vanasse Hangen Brustlin, Inc.

Employee Shuttle Bus Service

In order to promote transit use and to assist employees in reaching the MBTA's rapid transit stations, several shuttle services utilizing passenger vans are offered in the study area by:

- Boston City Hospital - operates two weekday free employee shuttle services from Ruggles Station on the Orange Line and Andrew Station on the Red Line to the hospital. Each shuttle operates every 20 minutes during peak commuting periods (6:30 to 9:30 AM and 2:30 to 6:30 PM). This shuttle bus service is also available on demand from 6:30 to 8:30 PM and 10:30 PM to 12:30 AM.

- Boston University Medical Center - provides a free shuttle service between the Broadway MBTA station on the Red Line and East Newton Street. BUMC also runs shuttles to the C Lot parking area during peak commuting hours.

6.2.4 PEDESTRIANS

Pedestrian Network Description and Volumes

Pedestrian access to the site is currently provided directly from Albany Street. Other corridors that provide pedestrian access to the site include East Concord Street, East Newton Street, and East Brookline Street.

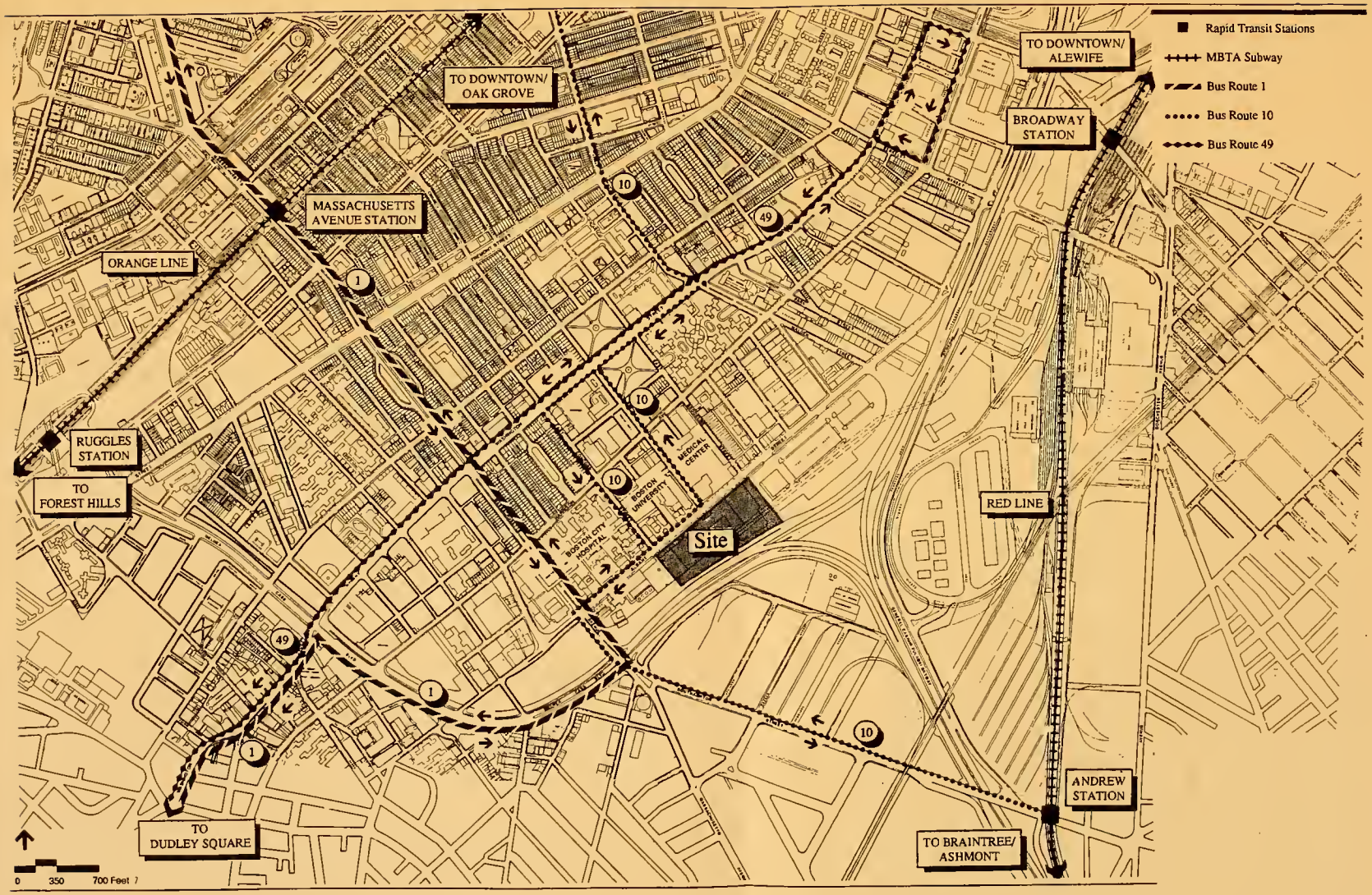
Pedestrian counts were conducted in December 1990 during the morning (7:00-9:00 AM), midday (11:00 AM-1:00 PM), and evening (4:00-6:00 PM) commuter peak periods at the following locations:

- Albany Street and East Concord Street
- Albany Street and East Newton Street
- Albany Street and East Brookline Street

Exhibits 6-9, 6-10, and 6-11 present the pedestrian volumes at these locations for the morning, midday, and evening peak hour, respectively. As shown, pedestrian volumes are heaviest crossing Albany Street at the intersection of Albany Street and East Newton Street. Pedestrian volumes are light crossing each of the minor streets.

6.3 PROBABLE PROJECT IMPACTS

To assess the impacts of the proposed University Associates Development on the transportation system within the study area, separate travel demand projections were made for each proposed land use and trip purpose or type (work or non-work). Projected trips were then distributed to the various transportation networks--roadway, transit, and pedestrian. Project impacts (Build conditions) were identified by comparison to future conditions without the proposed development (No-Build).



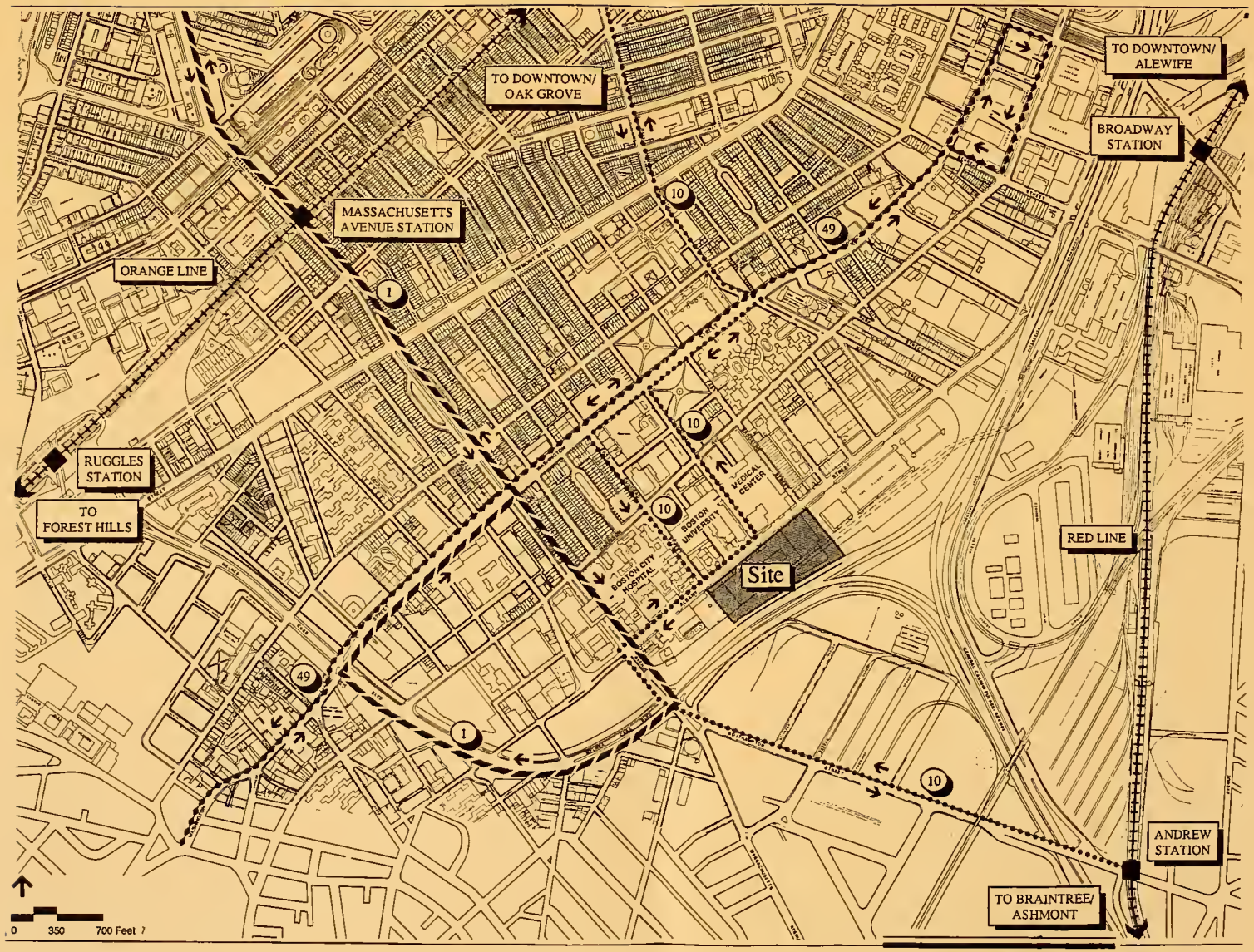
UNIVERSITY ASSOCIATES

Location of Public Transportation

Exhibit 6 - 7

Prepared by:
Vanasse Hangen Brustlin, Inc.

NOVEMBER 1991



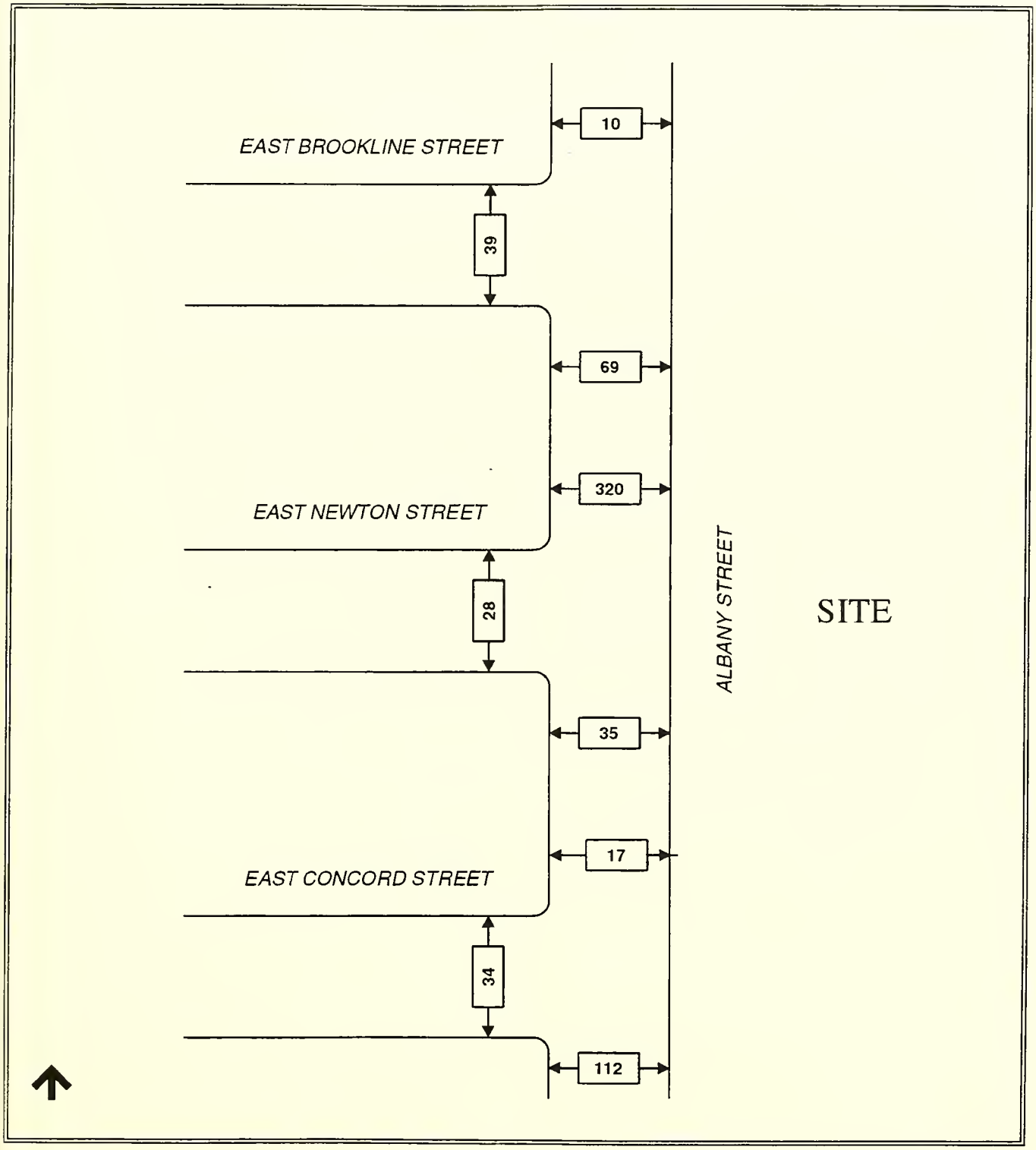
UNIVERSITY ASSOCIATES

Location of Public Transportation (continued)

Exhibit 6 - 8

Prepared by:
Vanesse Hangen Brustlin, Inc.

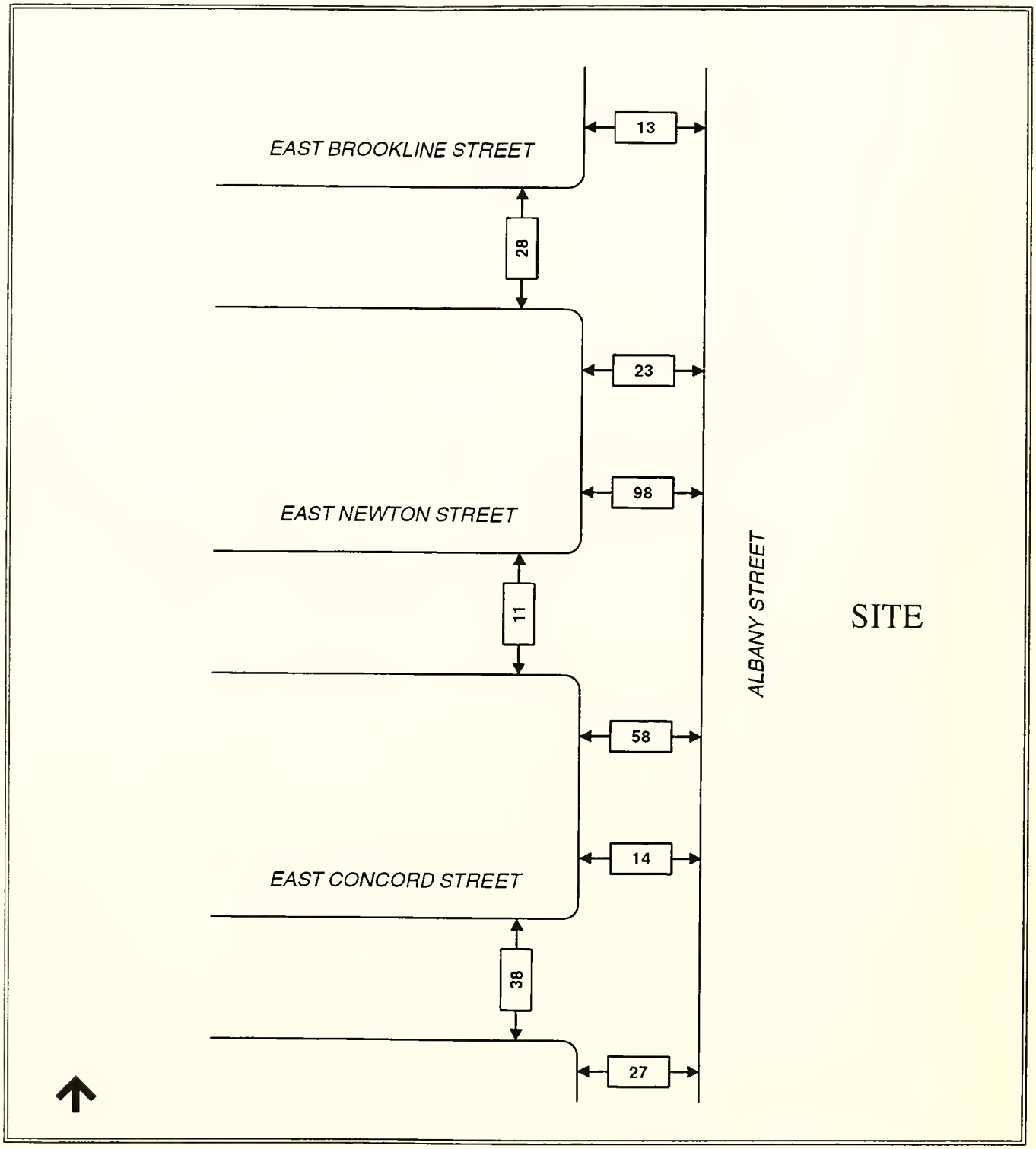
NOVEMBER 1991



Existing Pedestrian Volumes Morning Peak Hour

Prepared By:
Vanasse Hangen Brustlin, Inc.

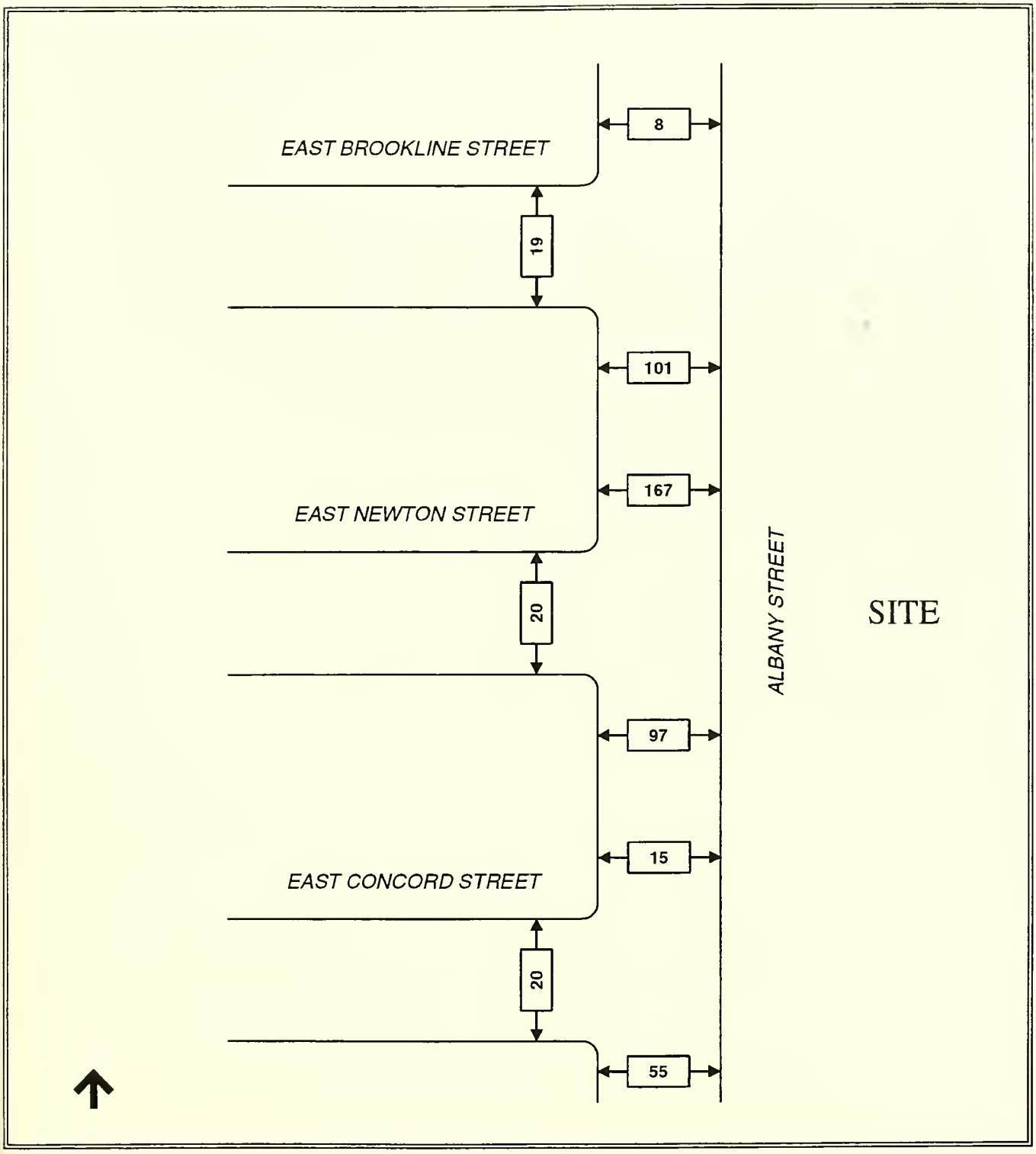
Exhibit 6 - 9



Existing Pedestrian Volumes Midday Peak Hour

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 10



Existing Pedestrian Volumes Evening Peak-Hour

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 11

6.3.1 METHODOLOGY

Project travel demands were forecast based on the building program previously shown in Table 6-1. Trips by mode of travel were calculated on a daily basis and for the morning and evening commuter peak hours.

Future travel demands for the project were forecast using daily person-trip generation rates for the proposed build program by type of trip (work and non-work). Travel mode (vehicle, transit, or walk) percentages, vehicle occupancy rates (average number of persons per vehicle), and peak hour factors (the percentage of total tripmaking occurring during each peak hour) were then applied to the resulting person trips to derive peak hour trips by mode. The daycare facility provided in the build program was not considered a significant trip generator because of its small size and its intended use which is primarily for building tenants and BUMC employees.

A variety of sources were used to determine the travel characteristics of employees, patients and visitors to the types of land uses proposed by this project. These sources included:

- Surveys conducted for the Interinstitutional Transportation Management Association (ITMA) in December 1990 at University Hospital, Boston University Medical Center, and Boston City Hospital (used for mode split, temporal distribution, and vehicle occupancy rates for work trips to general office, medical office and research space);

- Surveys conducted by VHB in January 1991 at The University Hospital Doctors Office Building (used for mode split for medical office non-work trips as well as daily person trip generation rates for both work and non-work trips);

- The Longwood Medical Area Galleria Study[9] (used to develop retail vehicle-trip generation rates);

- The Boston Science Center EIR[10] (used for research person-trip generation rates);

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[9] Longwood Medical Area Galleria Project, Vanasse Hangen Brustlin, Inc., Memorandum, June 1985.

[10] Boston Science Center, Draft Project Impact Report/ Draft Environmental Impact Report, EOEA #7111, Congress Group Ventures, December 1988.

- The Fan Pier/Pier 4 Development EIR[11] using survey data from Holiday Inn on Cambridge Street and from the Marriott Long Wharf Hotel (used to develop hotel vehicle-trip generation rates); and

- The Institute of Transportation Engineers Trip Generation Report[12] (used to refine vehicle-trip generation rates for research and retail space).

These travel characteristics were used to project the number of trips generated by future development at the site.

6.3.2 TRIP GENERATION

The (24-hour weekday) daily person-trip generation rates for the project uses are shown in Table 6-8. Person-trip generation rates have been classified as work and non-work. Work-related trips are defined as the daily commuting trips to and from the place of work. Non-work trips include all non-commuting trips made by employees and all trips made by visitors to the site. A comment was raised relative to the trip generation associated with the proposed restaurant. The restaurant trip generation is included in the trip generation for the hotel use as indicated in ITE's Trip Generation.[13]

Table 6-9 presents the percentage of daily arrivals and departures expected to occur during the morning and evening peak hours. Different peak hour percentages have been applied based on the type of trip (work or non-work), land use, and mode of travel. The majority of trips occurring during the peak hours are work trips made by commuters.

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[11] Fan Pier Development/Pier 4 Development, Final Environmental Impact Report, EOEA #4426/4584, Vanasse Hangen Brustlin, Inc., November 1986.

[12] Trip Generation, 4th Edition, Institute of Transportation Engineers.

[13] Ibid.

Table 6 - 8
DAILY PERSON-TRIP GENERATION RATES*

Use	Purpose	In	Out	Total
General Office	Work	4.40	4.40	8.80
	Non-Work	2.35	2.35	4.70
	TOTAL	6.75	6.75	13.50
Retail	Work	2.00	2.00	4.00
	Non-Work	50.00	50.00	100.00
	TOTAL	52.00	52.00	104.00
Hotel**	Work	1.00	1.00	2.00
	Non-Work	5.94	5.94	11.88
	TOTAL	6.94	6.94	13.88
Medical Office	Work	3.77	3.77	7.54
	Non-Work	19.36	19.36	38.72
	TOTAL	23.13	23.13	46.26
Research	Work	2.20	2.20	4.40
	Non-Work	0.99	0.99	1.98
	TOTAL	3.19	3.19	6.38

* Person trips per 1,000 square feet (except for hotel).
**Person trips per room, includes restaurant trip generation.

Source: Various studies (See introduction).

Table 6 - 9
PERCENTAGE OF DAILY TRIPS DURING PEAK HOURS

Use	Direction	Work		Non-Work	
		Morning Peak	Evening Peak	Morning Peak	Evening Peak
General Office	In	55%	2%	10%	2%
	Out	1%	55%	1%	10%
Retail	In	10%	0%	0%	10%
	Out	0%	0%	0%	11%
Hotel	In	5%	2%	7%	12%
	Out	1%	6%	8%	9%
Medical Office	In	44%	1%	0%	0%
	Out	1%	50%	0%	15%
Research	In	28%	0%	0%	0%
	Out	0%	13%	0%	0%

Source: Various studies (See Methodology at the beginning of Probable Project Impacts section).

Table 6-10 shows the percentage of total travel expected to be made by each travel mode--automobile, transit, and walk. A comment was raised relative to the source for walk percentages for non-work trips for hotel and research facilities. These walk percentages were developed to reflect the expected nature of the hotel - primarily serving patients and visitors to the two hospitals, and the nature of the research facilities - staffed by employees of the Boston University Medical Center, many of whom would walk between campus buildings as opposed to making trips outside of the area.

Table 6 - 10
MODE SHARE PERCENTAGES

Use	Purpose	Travel Mode		
		Auto	Transit	Walk
General Office	Work	60%	37%	3%
	Non-Work	76%	16%	8%
Retail	Work	50%	45%	5%
	Non-Work	5%	0%	95%
Hotel	Work	60%	37%	3%
	Non-Work	60%	5%	35%
Medical Office	Work	60%	37%	3%
	Non-Work	76%	16%	8%
Research	Work	60%	37%	3%
	Non-Work	40%	10%	50%

Source: Various studies (see Methodology at the beginning of Probable Project Impacts section).

Vehicle occupancy rates (VOR) describe the average number of persons per vehicle. These rates are divided into the number of person trips by automobile to derive the number of vehicle trips generated by the site. Table 6-11 presents the vehicle occupancy rates used for the different proposed land uses.

Table 6 - 11
VEHICLE OCCUPANCY RATES

Use	Purpose	VOR
General Office	Work	1.2
	Non-Work	1.2
Retail	Work	1.0
	Non-Work	1.9
Hotel	Work	1.4
	Non-Work	1.5
Medical Office	Work	1.2
	Non-Work	1.0
Research	Work	1.2
	Non-Work	1.2

Source: Various studies (see Methodology at the beginning of Probable Project Impacts section).

The travel demand characteristics detailed above were applied to the build program of the University Associates project. The resultant number of trips by travel mode and time period for the development is displayed in Table 6-12.

As shown in the table, the proposed development will generate 4,706 daily vehicle trips, 447 morning peak hour trips and 454 evening peak hour trips. A total of 1,880 transit trips are forecast per day. In addition, 3,456 walk trips are forecast per day. Almost 3,000 of these daily walk trips are associated with the hotel and retail components of the project. They consist of mostly non-peak hour trips which are internal to the site or study area.

Institute of Transportation Engineers Trip Generation Projections

As required by the MEPA guidelines for traffic impact analysis, unadjusted Institute of Transportation Engineers (ITE) vehicle-trip estimates are discussed in this section. The specific ITE rates are presented in Appendix F, Transportation and Parking. Table 6-13 compares the resulting travel demands for the project using unadjusted ITE rates with rates developed from area institutional surveys.

Table 6 - 12
PROJECT-GENERATED TRIPS

Trips By:	Auto*	Transit**	Walk**
Daily			
In	2,353	940	1,728
Out	2,353	940	1,728
TOTAL	4,706	1,880	3,456
Morning Peak Hour			
In	391	272	60
Out	56	12	43
TOTAL	447	284	103
Evening Peak Hour			
In	90	19	161
Out	364	260	181
TOTAL	454	279	342

*Vehicle trips.
**Person trips.

Source: Vanasse Hangen Brustlin, Inc.

The use of unadjusted ITE trip generation rates results in a significantly larger number of vehicle trips for the project compared with the use of the rates developed from surveys in the study area and other local sources of travel characteristics. This difference is due to the fact that the ITE rates are primarily based on suburban sites with little or no transit use or walk trips. The analysis performed for this study is based upon surveys of employees, patients and visitors of the area institutions. Their travel patterns are significantly different from those traveling to suburban institutions. For example, according to the institutional surveys conducted for this Final PIR, approximately 60 percent of work trips are made by automobile compared with about 95 percent of employees who work in a suburban development. In addition, suburban vehicle trips generally include a lower vehicle occupancy rate than that found in the surveys (1.05 persons per vehicle compared with 1.2 persons per vehicle in the study area). For these reasons, ITE trip generation rates are not considered to be applicable to a development in this study area and were, therefore, not used in the project travel demand analysis.

A comment was raised on the DEIR/DPIR by the Secretary of Environmental Affairs concerning the use of locally-derived trip generation rates rather than Institute of Transportation Engineers (ITE) rates. The following discussion demonstrates that specific mitigation will ensure that future traffic generation rates will not differ from the survey rates.

As the proposed development gets underway, changes in the management of parking will likely further discourage driving to the area. In fact, because the number of parking spaces proposed was determined by using the known travel patterns of employees and does not exceed the projected demand, the parking supply should limit the potential for increased automobile use.

In addition to limiting the parking supply to essentially meet the project's estimated demand, University Associates is committed to improving ridesharing and public transportation opportunities through the Interinstitutional Transportation Management Association (ITMA) which is discussed in detail in the Mitigation section of this report.

Table 6 - 13
VEHICLE-TRIP GENERATION COMPARISON

	Using Unadjusted ITE Rates	Using Local Survey Rates
Daily		
In	4,324	2,353
Out	4,324	2,353
TOTAL	8,648	4,706
Morning Peak Hour		
In	748	391
Out	164	56
TOTAL	912	447
Evening Peak Hour		
In	292	90
Out	838	364
TOTAL	1,130	454

Source: Vanasse Hangen Brustlin, Inc.

6.3.3 FUTURE TRAFFIC CONDITIONS

Development of No-Build Traffic Networks

The previous section defined the project traffic generation for the 2000 Full-Build scenario. These volumes must be added to traffic flows expected on the No-Build roadway network. Development of the No-Build traffic volume projections requires identifying road improvement projects and land use changes expected to be completed by 2000 as well as all other factors influencing the transportation system in the study area. These are:

- Completion of the Central Artery/Tunnel (CA/T) project, resulting in dramatic changes to the volume and distribution of traffic (see Exhibit 6-12)
- Modification of the Massachusetts Avenue Connector to an at-grade facility with slightly different alignment than the existing connector (see Exhibit 6-13)
- Improvements to the traffic signal operations along Massachusetts Avenue[14]
- Improvements to the Massachusetts Avenue corridor by providing two through lanes and one left-turn lane at all major intersections (part of the Prudential Center Redevelopment mitigation plan)[15]
- Growth in travel demand associated with local development projects expected to be completed by 2000 (as presented in the Central Artery/Third Harbor Tunnel Project, Land Use projections for the Boston Metropolitan Core 1986-2010)
- Growth in travel demand along major corridors that pass through the study area associated with regional growth

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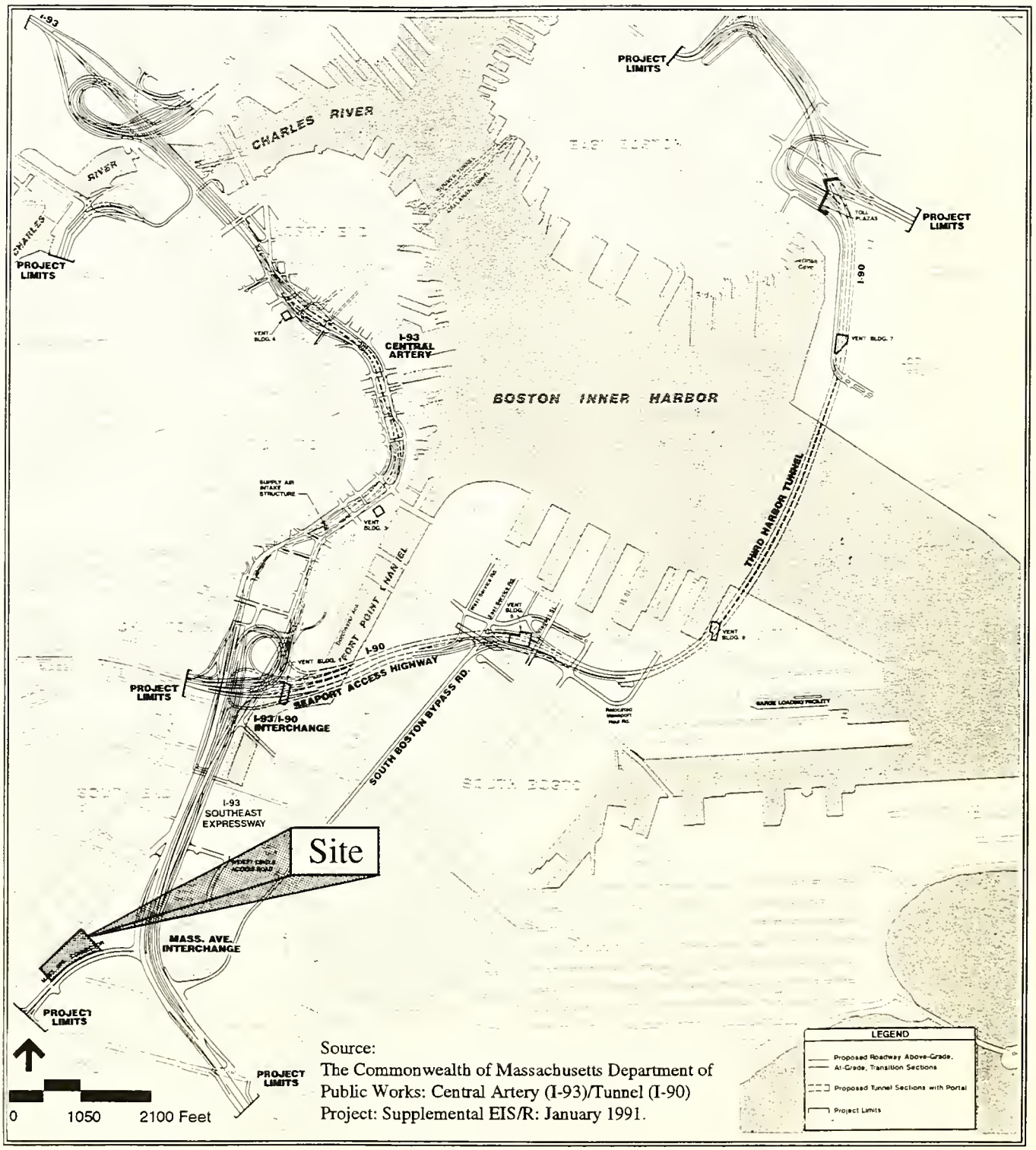
[14] The Boston Transportation Department (BTD) is actively involved in programs to improve traffic circulation in the study area. One program currently being implemented involves coordinating traffic signals along the Massachusetts Avenue corridor in order to reduce traffic delay. These coordinated signals are presently being connected to a centralized computer control system to make signals "traffic responsive". Ultimately, operation of these signals can be modified as necessary using roadway detection devices that measure changes in traffic volumes on selected roadway links.

[15] In addition to this program, the BTD, in conjunction with the Boston Redevelopment Authority (BRA), is initiating a transportation study of the South End.

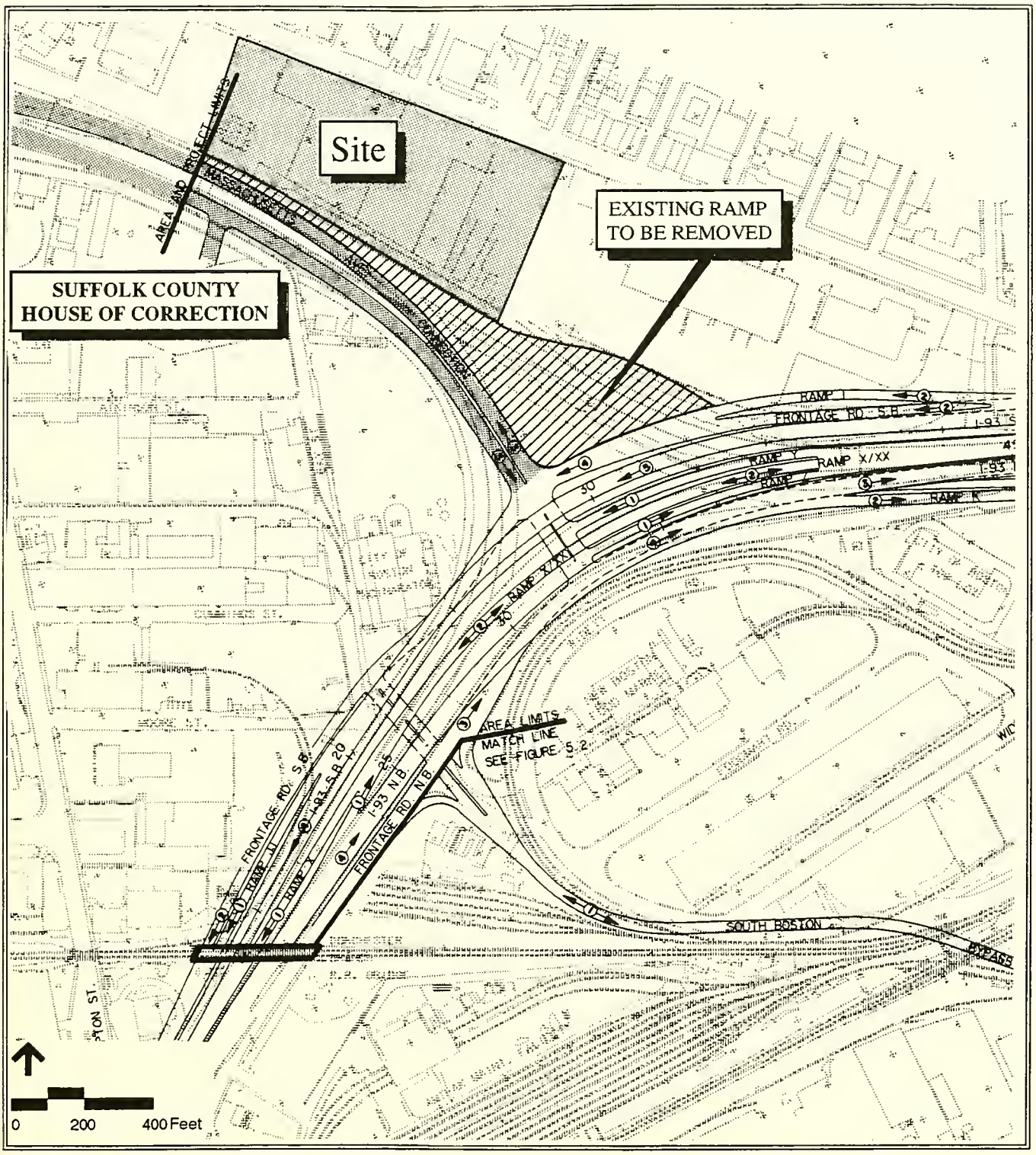


Source:
The Commonwealth of Massachusetts Department of Public Works: Central Artery (I-93)/Tunnel (I-90) Project: Supplemental EIS/R: January 1991.

Proposed Action - Central Artery /Tunnel Project

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 12



Proposed Realignment of Massachusetts Avenue Connector

Prepared By:
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Exhibit 6 - 13

Exhibits 6-14 and 6-15 present the 2000 No-Build morning peak hour and evening peak hour traffic volumes, respectively. As explained in detail below, these volumes were developed in three steps:

- Existing traffic volumes were first rerouted to reflect the combined effect of all road improvement projects expected to be completed before 2000. It should be noted that the traffic volume changes resulting from the aforementioned improvements are substantial, and result in fewer through trips being made by commuters on city streets with more trips made on the regional highway system.

- The resulting volumes were next multiplied by a growth factor to reflect increased travel demands generated by development projects outside the study area. An annual growth rate of 0.5 percent was used. Recent Metropolitan Area Planning Council (MAPC) employment projections for Boston were examined to estimate an annual growth rate. The data revealed that a small annual increase in employment is expected in the Boston area beyond 1991. Based on the data available, existing traffic movements at each analysis location were increased by 0.5 percent per year to reflect background growth from developments outside the study area.

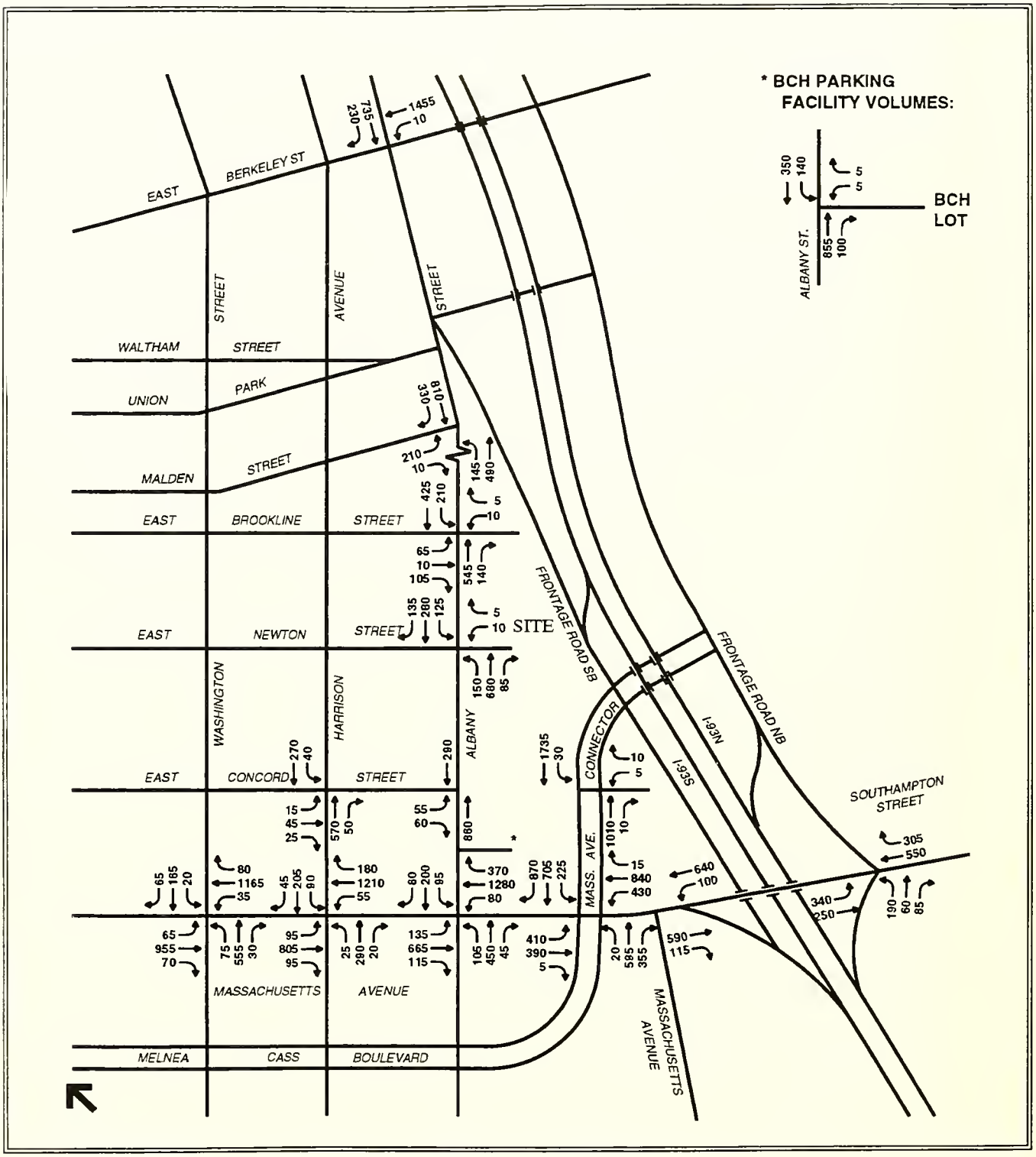
- Finally, estimated traffic volumes generated by all known background developments within the study area were added.[16] These background developments include:

    - an increase of 766,990 square feet of residential space
    - an increase of 5,952 square feet of retail space
    - an increase of 145,430 square feet of office space
    - an increase of 18,000 square feet of cultural/recreational space
    - an increase of 152,000 square feet of industrial space
    - an increase of 251,910 square feet of medical space

[16] Source: Central Artery/Third Harbor Tunnel Project. Land Use Projections for the Boston Metropolitan Core 1986-2010, Final Report, Massachusetts Department of Public Works, July 1989. Development in Zones 48A, 48B, 51, 52A, 52B, 53A, and 54 were considered for local background development. Development in Zone 53B, where the University Associates project is planned, was not added to the local background development.

- a decrease of 35,000 square feet of transportation space
- a decrease of 11,543 square feet of educational space

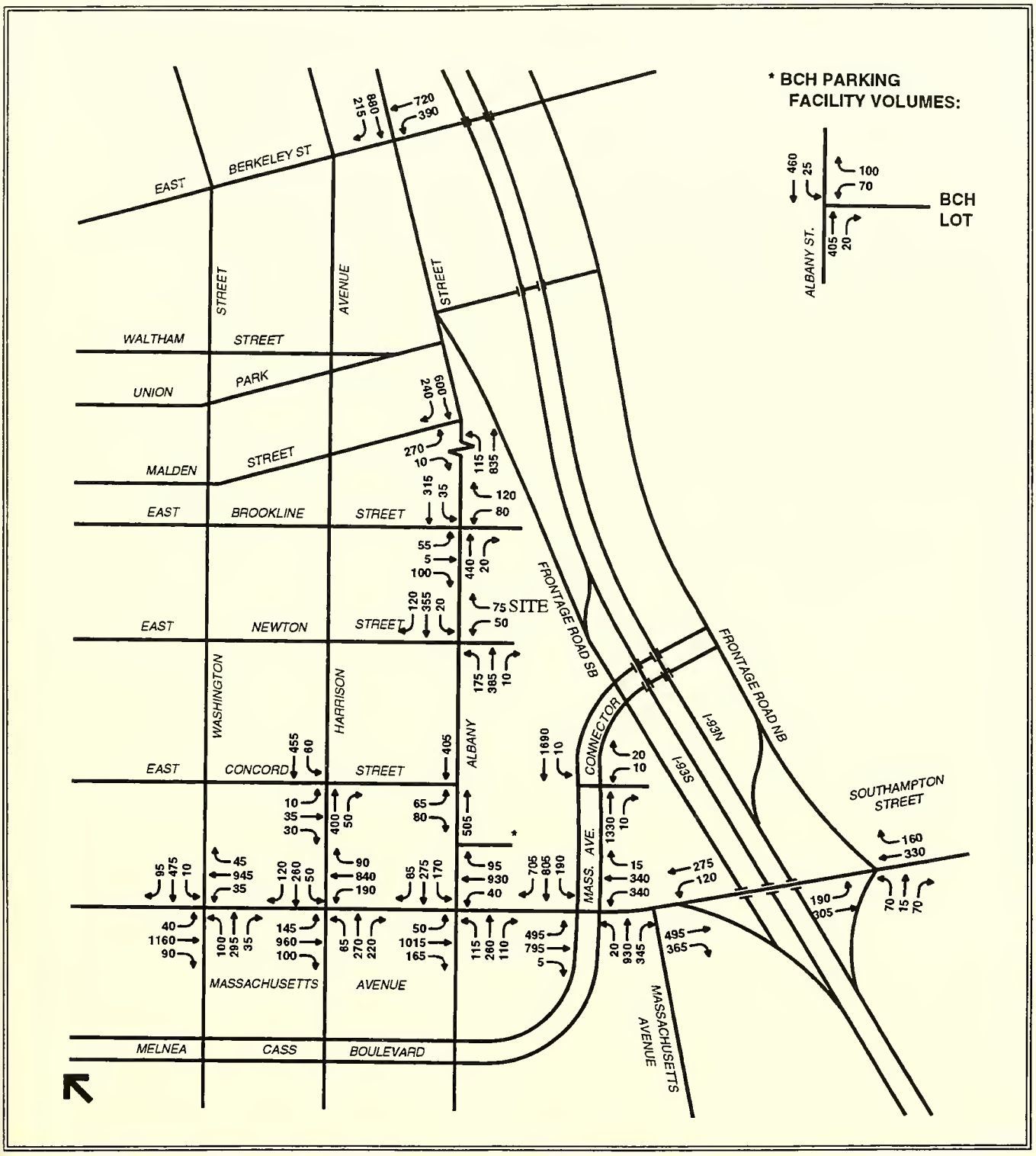
The resulting volumes are 2000 No-Build volumes.



2000 No-Build Morning Peak Hour Traffic Volumes

Prepared
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 14



2000 No-Build Evening Peak Hour Traffic Volumes

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 15

Trip Distribution and Assignment

The distribution and assignment of vehicle trips to the study area roadway network is a function of the available parking supply, travel patterns, and travel distances to and from a particular site. To assess impacts on study area roadways, vehicle trips generated by the proposed background developments in the study area and vehicle trips generated by the University Associates project were distributed to the roadway system. This distribution was based primarily on journey-to-work data from surveys conducted at University Hospital and Boston University Medical Center. The patterns for distributing trips to the regional highway system are given in Table 6-14. Assignments to specific roadways are based on the location of the site, local roadway circulation, and connections to the regional highway system.

A comment was raised relative to the potential for increased use of Massachusetts Avenue by Massachusetts Turnpike users headed westbound in the evening peak hour as a result of the left turn from Massachusetts Avenue onto the Turnpike being made legal and given an exclusive lane. Although 13 percent of the project vehicle trips were assigned to Massachusetts Avenue, the comment raises the question as to what would occur if this percentage were to increase as a result of the improvement at the intersection of Massachusetts Avenue and Newbury Street. A total of 22 percent of project trips are assigned to the Massachusetts Turnpike. If half of these trips were to shift to Massachusetts Avenue from the Southeast Expressway for their outbound trip, the net result would be an increase of 40 vehicles using Albany Street to turn right onto Massachusetts Avenue. This would have no significant impact on the predicted Build condition level of service at the intersection of Massachusetts Avenue and Albany Street because the additional volume would be added to the southbound right turn which is not a critical movement for intersection operation at this location.

Table 6 - 14
VEHICLE-TRIP DISTRIBUTION

Route and Direction	Percent
Route I-93 - South	27
Route I-93 - North*	48
Albany Street - North	4
West Fourth Street - East	1
Southampton Street - East	1
Malden Street - West	2
Massachusetts Avenue - West	13
Melnea Cass Boulevard	4
TOTAL	100

*Includes Massachusetts Turnpike traffic (22 percent).

Source: South End Medical Area Planning Study, Final Report: Transportation Elements, Howard/Stein-Hudson Associates, June 1989.

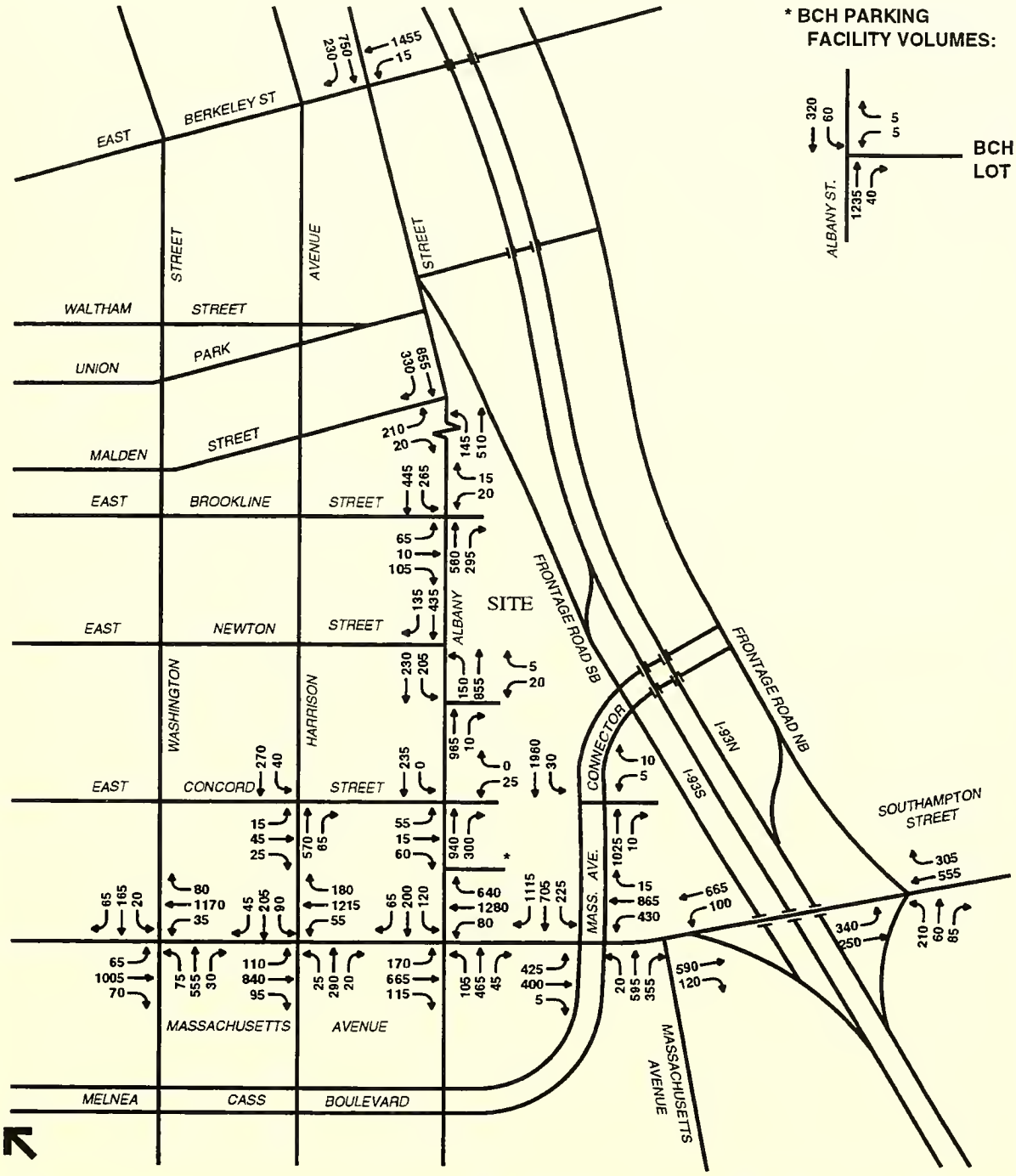
Development of Build Traffic Networks

Project-generated vehicle trips were distributed onto the highway network expected to be operational and in place by 2000 to develop the 2000 Build morning and evening peak hour traffic networks. Exhibits 6-16 and 6-17 present the 2000 Build morning and evening traffic volumes, respectively. These volumes were used to complete the future intersection level-of-service analysis.

Intersection Level-of-Service Analysis Results

Analysis procedures for future intersection level-of-service are based on the Highway Capacity Manual (HCM), as described in the Existing Conditions section of this chapter. As explained previously, intersection levels-of-service A through D

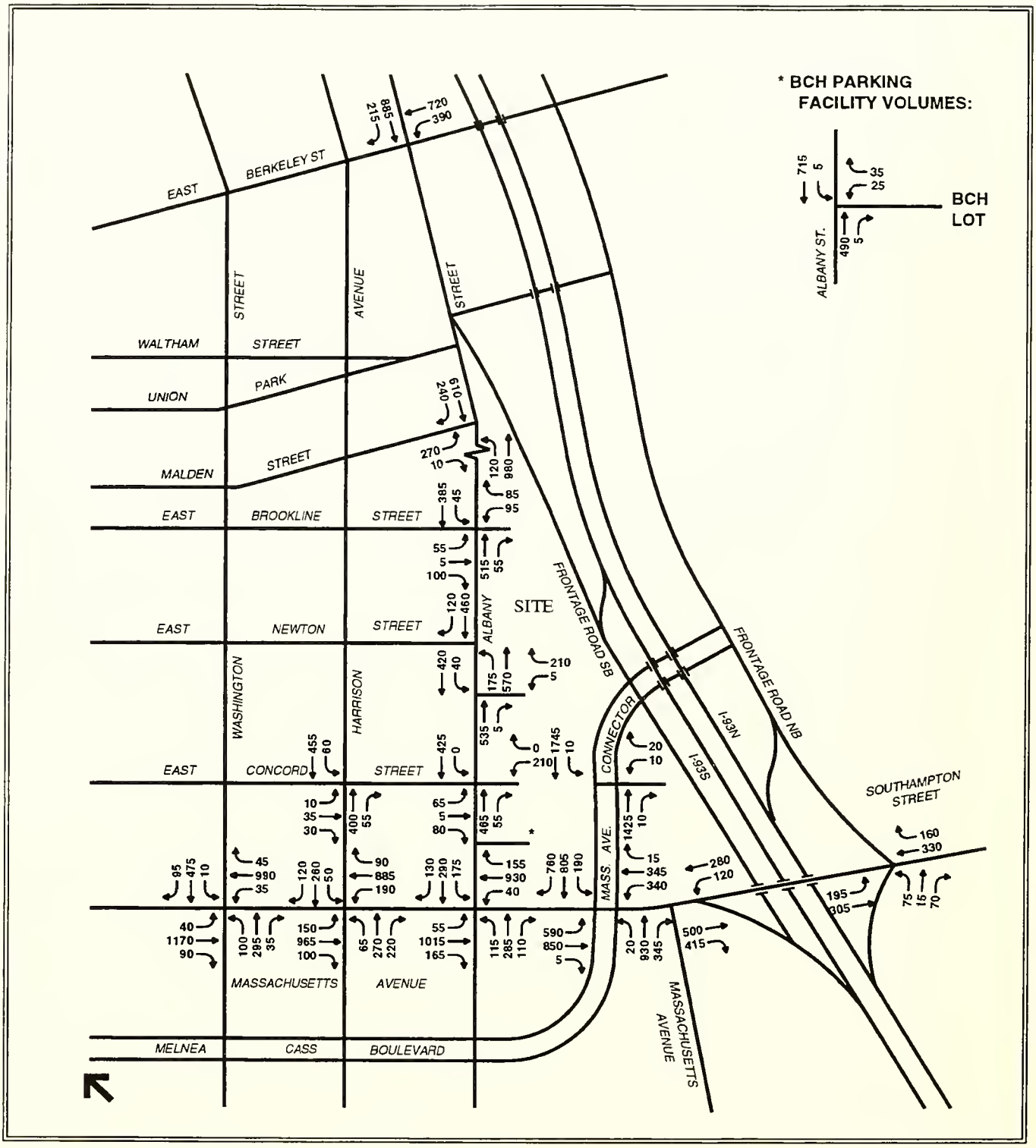
are considered acceptable in urban areas, while levels-of-service E and F are considered deficient. Tables 6-15 and 6-16 provide a summary of signalized intersection analysis results for Existing, 2000 No-Build, and 2000 Build conditions. For future analysis of signalized intersections, improved signal timing was assumed to account for planned improvements in the area. Tables 6-17 and 6-18 provide a summary of unsignalized intersection analysis results. The results of these analyses are discussed in greater detail in the following section.



2000 Build Morning Peak Hour Traffic Volumes

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 16



2000 Build Evening Peak Hours Traffic Volumes

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 17

Table 6 - 15
SIGNALIZED INTERSECTION LEVEL OF SERVICE - MORNING PEAK HOUR

Intersection Number and Location	Existing			2000			No-Build		
	V/C*	Delay**	LOS***	V/C	Delay	LOS	V/C	Delay	LOS
1 Albany Street/ East Berkeley Street	0.57	19	C	0.46	13	B	0.46	13	B
6 Harrison Avenue/ East Concord Street	0.38	6	B	0.50	6	B	0.5	16	B
7 Massachusetts Ave./ Washington Street	0.50	12	B	0.76	13	B	0.77	13	B
8 Massachusetts Ave./ Harrison Avenue	0.72	22	C	0.77	23	C	0.78	24	C
9 Massachusetts Ave./ Albany Street	0.80	33	D	0.79	20	C	1.07	31	D
10 Massachusetts Ave./ Melnea Cass Boulevard	0.93	35	D	0.95	40	E	1.07	49	E

*Volume-to-capacity ratio.
**Average stopped delay per vehicle in seconds.
***Level of service.

Source: Vanasse Hangen Brustlin, Inc.

Table 6 - 16
SIGNALIZED INTERSECTION LEVEL OF SERVICE - EVENING PEAK HOUR

Intersection Number and Location	Existing V/C*	Existing Delay**	Existing LOS***	2000 NoBuild V/C	2000 NoBuild Delay	2000 NoBuild LOS	2000 Build V/C	2000 Build Delay	2000 Build LOS
1 Albany Street/ East Berkeley Street	0.70	47	E	0.45	13	B	0.44	14	B
6 Harrison Avenue/ East Concord Street	0.29	5	B	0.37	5	B	0.37	5	B
7 Massachusetts Ave./ Washington Street	0.61	14	B	0.60	13	B	0.60	14	B
8 Massachusetts Ave./ Harrison Avenue	0.82	34	D	0.86	41	E	0.86	47	E
9 Massachusetts Ave./ Albany Street	0.84	48	E	0.87	51	E	0.86	60+	F
10 Massachusetts Ave./ Melnea Cass Boulevard	1.02	48	E	1.07	60+	F	1.09	60+	F

*Volume-to-capacity ratio.
**Average stopped delay per vehicle in seconds.
***Level of service.

Source: Vanasse Hangen Brustlin, Inc.

The level-of-service analysis results presented in Tables 6-15 and 6-16 can be summarized as follows:

- LOS improves from existing to No-Build conditions during both peak hours at the intersection of Albany Street and East Berkeley Street primarily due to the CA/T project. A comment was raised relative to the assumptions used to predict this improvement in LOS. The improved LOS is a result of an anticipated decrease in traffic volume at this intersection as predicted by the CA/T team. If the CA/T design is

modified, any changes that impact predicted traffic volumes may affect intersection level of service.

- LOS improves from existing to No-Build conditions during the morning peak hour at the intersection of Albany Street and Massachusetts Avenue, also due to the CA/T project and improvements to Massachusetts Avenue.

- LOS declines from existing to No-Build conditions during the evening peak hour at the intersection of Massachusetts Avenue and Harrison Avenue (LOS D to LOS E) and during both the morning and evening peak hours at the intersection of Massachusetts Avenue and Melnea Cass Boulevard (LOS D to LOS E in the morning and LOS E to LOS F in the evening).

- As a result of the development, but without mitigation, project traffic will diminish level of service at one signalized intersection (Massachusetts Avenue and Albany Street) during the morning peak hour (LOS C to LOS D) and the evening peak hour (LOS E to LOS F). Potential measures to improve operation of this intersection are presented later in the Transportation Mitigation Plan.

Table 6 - 17
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE - MORNING PEAK HOUR

Location Number*	Intersection and Critical Movement(s)	Existing ARC*	Existing LOS	2000 No-Build ARC	2000 No-Build LOS	2000 Build ARC	2000 Build LOS
2	Albany Street and Malden Street						
	Left turn from Malden Street	0	F	0	F	0	F
3	Albany Street and East Brookline Street						
	Left turn from East Brookline Street	116	D	29	E	0	F
	Left turns from BUMC Parking Area	181	D	72	E	20	E
4	Albany Street and East Newton						
	All moves from BUMC Parking Area	141	D	107	D	--	--
5	Albany Street and East Concord Street						
	Left turn from East Concord Street	147	D	185	D	50	E
	All moves from site driveway	--	--	--	--	86	E
11	Southampton Street and I-93 Southbound Ramp						
	Left turn from I-93 southbound ramp+	29	E	--	--	--	--
	Left turn from Southampton Street (WB)	--	--	568	A	568	A
12	Southampton Street and I-93 Northbound Ramp						
	Left turn from I-93 northbound ramp	0	F	0	F	0	F

*Refer to Exhibit 6-1 for location of intersection.
**Available reserve capacity.
***Level of service.
+This turn is not allowed under future conditions. The ramp becomes one-way southbound as a result of Central Artery modifications.

Source: Vanasse Hangen Brustlin, Inc.

Table 6 - 18
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE - EVENING PEAK HOUR

Location Number*	Intersection and Critical Movement	Existing ARC**	Existing LOS***	2000 No-Build ARC	2000 No-Build LOS	2000 Build ARC	2000 Build LOS
2	Albany Street and Malden Street						
	Left turn from Malden Street	0	F	0	F	0	F
3	Albany Street and East Brookline Street						
	Left turn from East Brookline Street	482	A	175	D	127	D
	Left turns from BUMC Parking Area	260	C	166	D	82	E
4	Albany Street and East Newton Street						
	All moves from BUMC Parking Area	223	C	199	D	--	--
5	Albany Street and East Concord Street						
	Left turn from East Concord Street	275	C	216	C	200	C
	All moves from site driveway	--	--	--	--	0	F
11	Southampton Street and I-93 Southbound Ramp						
	Left turn from I-93 southbound ramp+	132	D	--	--	--	--
	Left turn from Southampton Street (WB)	--	--	621	A	616A	
12	Southampton Street and I-93 Northbound ramp						
	Left turn from I-93 northbound ramp	174	D	195	D	185	D

*Refer to Exhibit 6-1 for location of intersection.
**Available reserve capacity.
***Level of service.
+This turn is not allowed under future conditions. The ramp becomes one-way southbound as a result of Central Artery modifications.

Source: Vanasse Hangen Brustlin, Inc.

As shown in Tables 6-17 and 6-18, the proposed University Associates project is expected to reduce the level of service at two unsignalized intersections, Albany Street at East Concord Street and Albany Street and East Brookline Street. This decline in level of service is expected for both peak hours. These intersections are two of the three locations for which site access is provided. A proposed mitigation measure to improve level of service at these locations is to install traffic signals. The mitigation is discussed in detail later in the Transportation Mitigation Plan.

6.3.4 CONSTRUCTION PERIOD PARKING IMPACTS

A portion of the project development site is situated on land that is currently being used by Boston City Hospital (BCH) for employee parking. To mitigate the impacts of displacing these spaces, a parking replacement plan was developed by University Associates in conjunction with representatives of several city agencies. This plan was also prepared to satisfy the requirements of a federally guaranteed mortgage associated with BCH's new inpatient facility. University Associates will abide by the parking replacement agreement reached with the City Department of Public Facilities and Health and Hospitals.

The planning process for this replacement parking identified 481 BCH spaces as being impacted by the proposed University Associates development. Therefore, as part of the parking agreement between the City of Boston and University Associates, replacement parking will be provided for BCH employees. The location of these spaces will shift through the stage of construction for the research building, proposed parking garage, and proposed medical office building as illustrated in Exhibits 6-18 and 6-19 and as described below:

- Building 2 (the Boston University Center for Advanced Biomedical Research) will be the first building to commence construction. The construction area required results in the displacement of approximately 300 spaces. The replacement of these spaces will be accomplished by relocating the existing barrier between the BCH parking area and the BUMC A parking lot reducing the BUMC supply by 197 spaces. Some of this loss in spaces is made up through the use of spaces on adjacent parcels and through restriping. All BCH Albany Street spaces will continue to be entered and exited from the existing BCH driveway on Albany Street (See Exhibit 6-18, First Stage).

- In early 1992, BUMC will gain control over a parcel of land adjacent to the development site known as the Strumpf property (part of the Flower Market) at 600 Albany Street. The existing building will be

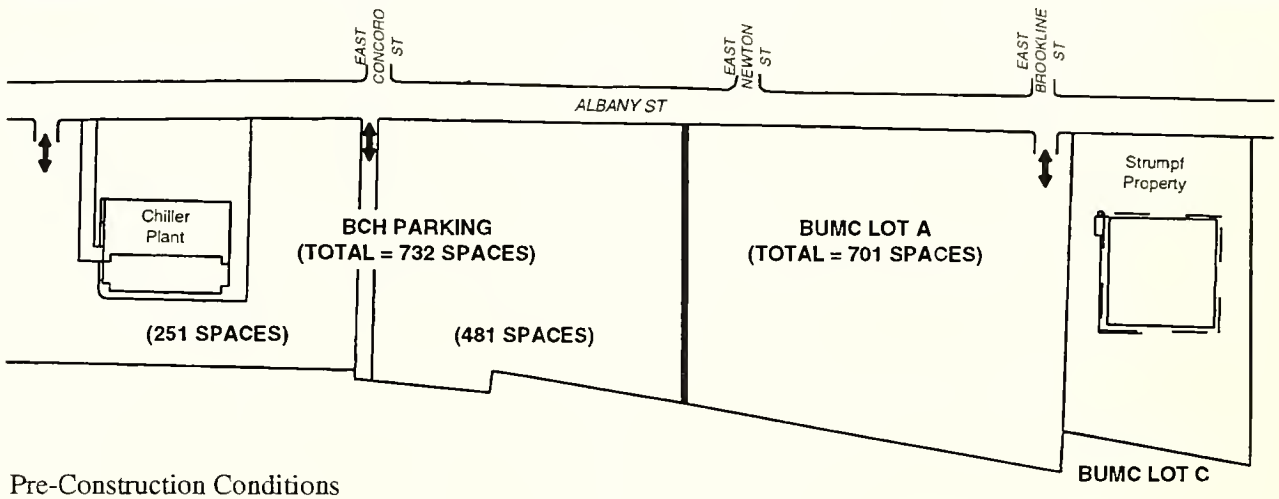
demolished and the land will be converted to approximately 360 surface parking spaces for BUMC employees. Currently, approximately 98 spaces on this site are being used for BUMC parking. This project is anticipated to take less than three months to complete.

- In the spring of 1992, construction will commence on the 1,000-space parking garage located opposite the BUMC Talbot building. This project will displace the remaining spaces of the total BCH parking being impacted. At this phase of the project, those BCH employees assigned to park in the 481-space replacement parking area will enter and exit the area from a BUMC-controlled parking area with a driveway opposite East Newton Street. This arrangement will last for approximately one year until the parking garage construction is completed (See Exhibit 6-19, Second Stage).

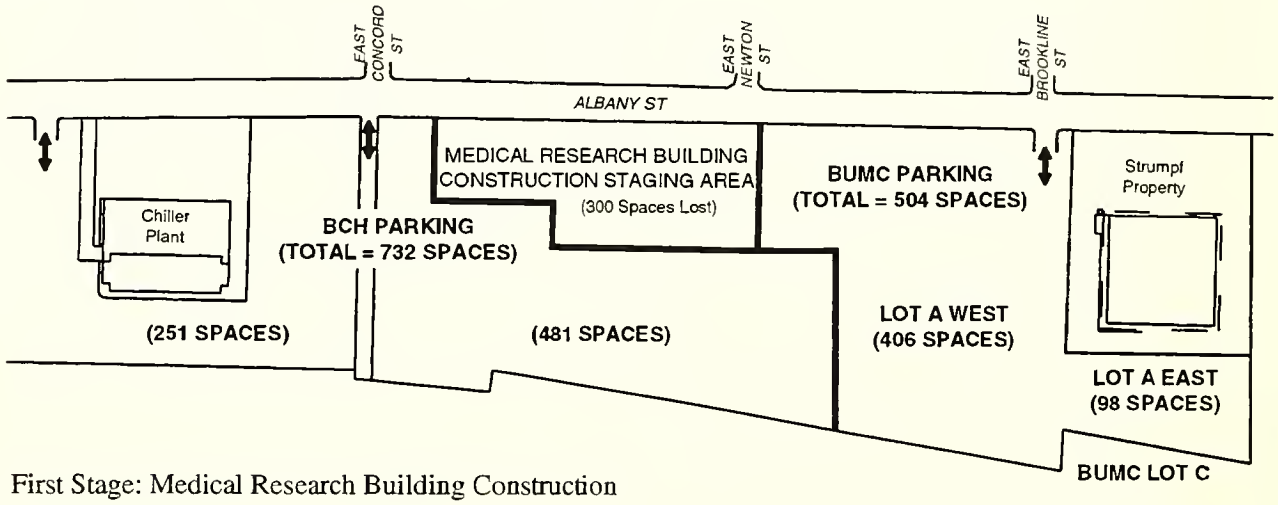
- In the spring of 1993, when the parking garage is completed, approximately 300 of the 1,000 spaces in the new garage will be designated for BCH employee parking. The remaining 181 of the 481 displaced parking spaces will be provided within the parking area used for BCH in the Second Stage. These spaces will be located to the rear of the parcel (closer to the Massachusetts Avenue Connector) to permit the development of the next building (medical offices) to proceed (see Exhibit 6-19, Third Stage).

- After the proposed medical office building is constructed, the schedule of remaining building development will be dependent on CA/T construction sequencing. Because BUMC currently provides parking for approximately 1,100 vehicles adjacent to and under the highway structure, many of these parkers will be relocated to surplus spaces in the parking garage. Additional off-site parking will likely be required to address the projected shortfall during construction activities.

- At Full-Build, all parking spaces within the development site will be in structured parking facilities. This includes the original 1,000-space garage, another on the Strumpf parcel, and potentially a third, smaller structure beneath the Medical Office building. A total of 2,375 parking spaces will be provided.



Pre-Construction Conditions

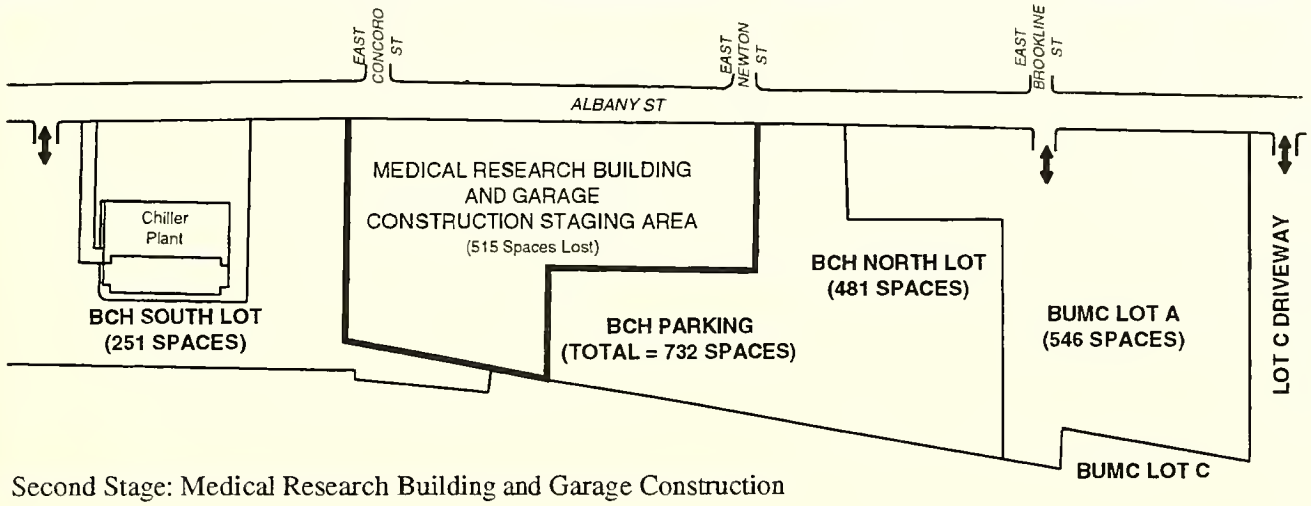


First Stage: Medical Research Building Construction

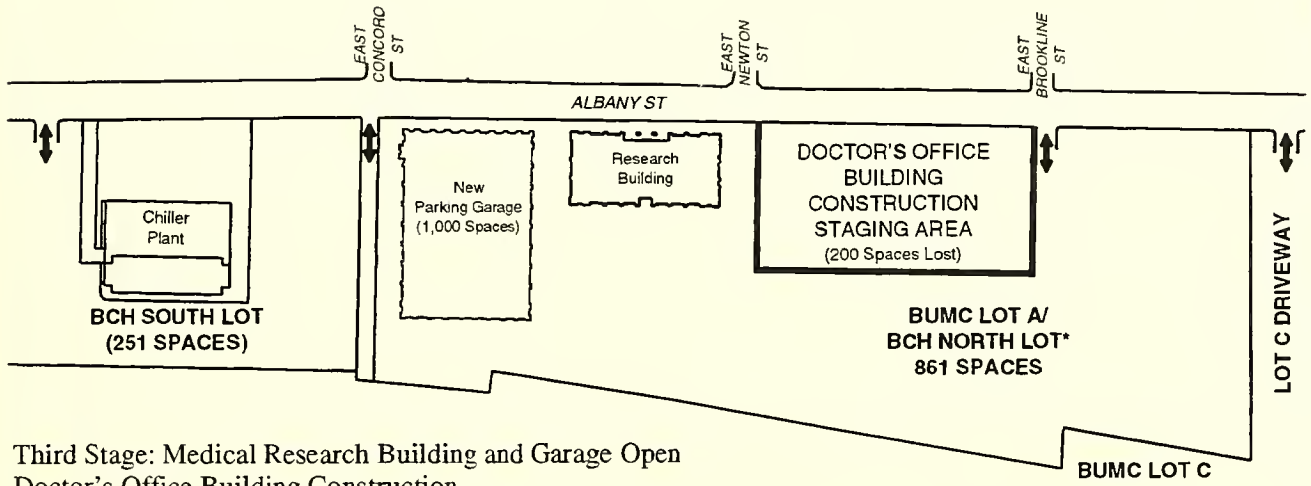
Interim Parking Construction of Medical Office Building and First Parking Garage

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 18



Second Stage: Medical Research Building and Garage Construction



Third Stage: Medical Research Building and Garage Open
Doctor's Office Building Construction

*Note: BCH will be provided 481 parking spaces north of East Concord St. (garage and surface spaces)

Interim Parking Construction of Medical Office Building and First Parking Garage (con't)

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 19

6.3.5 FULL-BUILD PARKING CONDITIONS

Project Parking Demand

The number of new parking spaces required by the proposed development was estimated from the trip generation projections for the different uses. Parking requirements are divided into long-term employee parking and short-term patient, visitor, and patron parking. Turnover rates represent the average number of vehicles that use a space each day. For employees, only one vehicle is assumed to use a space each day, while for patients, visitors, and patrons whose stays are shorter, higher turnover rates are expected. A turnover rate of one car per space per day for long-term parking was applied to the projected number of work-related vehicles arriving each day. For short-term parking, a number of different turnover rates were used depending on the type of use. Detailed parking generation rates are presented in Appendix F, Transportation and Parking.

As shown in Table 6-19, 1,265 net new parking spaces are estimated to be required to meet the demands of the proposed development.

Table 6 - 19
PROJECT-GENERATED NET NEW PARKING DEMAND

Use	Long-Term	Short-Term	Total
General Office	434	113	547
Retail	20	10	30
Medical Office	54	80	134
Hotel	53	79	132
Research	422	0	422
Total	983	282	1,265

Source: Vanasse Hangen Brustlin, Inc.

Future Parking Supply and Demand Relationship

The future parking supply and demand relationship for the University Associates development is affected by a number of factors. These include:

- The project-generated parking demand will vary according to who occupies the buildings planned for the second phase of development, parking pricing, and the success of the ITMA in reducing the demand for parking

- The future demand for Boston City Hospital employee parking, although expected to decline as a result of future reductions in personnel, cannot be fully determined at this time for several reasons, including the potential for converting to a fee-for-parking system, which has yet to be determined

- The design of the new Massachusetts Avenue interchange has not been sufficiently advanced to determine the net effects of this project on the land currently being used by BUMC for parking.

Accordingly, the discussion in the following paragraphs represents the best available estimate of future parking conditions. As described above, the project includes up to 1,265 net new spaces, to be included in at least two structured parking facilities (one parking structure to be located adjacent to the project site). No new surface parking will be provided within or adjacent to the development site with the exception of the existing BCH-controlled parking spaces to the south of Building 1 (not part of the University Associates project).

In addition to the new parking supply and demand provided by the proposed project, significant changes to the existing parking supply are anticipated in the future. By the Year 2000, the reconstruction of the Central Artery will displace parking spaces that currently serve the project site. It is estimated that 150 parking spaces will be permanently displaced as a result of Central Artery reconstruction. The parking supply/demand relationship is presented in Table 6- 20.

Table 6 - 20
FUTURE PARKING SUPPLY/DEMAND RELATIONSHIP

	Spaces Added	Spaces Lost	Total
Supply Changes:			
Parking Garage (Phase I)	1,000	(215)	785
Other Structures (Phase II)*	1,522	--	1,522
Star Brush Parking Lot	100	--	100
Helipad Relocation	--	(25)	(25)
Project Footprint	--	(967)	(967)
Central Artery	--	(150)	(150)
Net Change	2,622	(1,357)	1,265
Demand Changes:	Parkers Added	Parkers Subtracted	Total
Project Demand	1,265	0	1,265
Net Change	1,265		1,265
Future Surplus/(Deficit)	----	----	0

*Located beneath buildings on the site and adjacent to the site on property controlled by University Associates.

Source: Vanasse Hangen Brustlin, Inc.

As shown in the table, the project includes the addition of 1,265 net new parking spaces which will meet the project's parking demand of 1,265 spaces.[17]

[17] This number was revised from the Draft PIR because the 250- space reduction in BCH employee demand is no longer assumed as definite. As the project evolves, the sizing of future parking facilities will take parking needs into account.

6.3.6 FUTURE PUBLIC TRANSPORTATION CONDITIONS

Table 6-21 presents the number of peak hour transit trips generated by the proposed University Associates Development in the Year 2000. A total of 284 new morning peak hour trips and 279 new evening peak hour trips are expected.

Table 6 - 21
PROJECT-GENERATED TRANSIT TRIPS*

	Morning Daily	Evening Peak Hour	Peak Hour
In	940	272	19
Out	940	12	260
TOTAL	1,880	284	279

*All modes of public transportation.

Source: Vanasse Hangen Brustlin, Inc.

Based on the results of previous employee and patient surveys, 72 percent of all public transportation users who responded used bus service and 28 percent took a shuttle to either the Red Line or the Orange Line. Therefore, a total of 187 additional MBTA bus riders are projected to depart from the site in the evening peak hour. This represents 12 percent of the 1,558 passenger capacity of the five bus routes that serve the area.

Orange Line Replacement Service

The 1987 relocation of the Orange Line to the Southwest Corridor, which formerly provided service along Washington Street, eliminated rapid transit service from the immediate area. Bus Route 49 provides temporary replacement service along the Washington Street corridor. The MBTA has proposed construction of a new trolley bus line (also known as trackless trolley or electric bus) between Downtown Boston and Dudley Square in Roxbury. This line is to serve as a permanent replacement for the relocated Orange Line service. If the plans for this new trolley bus line are approved and implemented, access to the project site via public transportation will be improved. In addition, some shifts in passenger volumes on existing MBTA bus routes may take place as a result of this improved service.

6.3.7 FUTURE PEDESTRIAN CONDITIONS

This section describes future project site circulation and presents a discussion of project impacts on the pedestrian environments adjacent to the site.

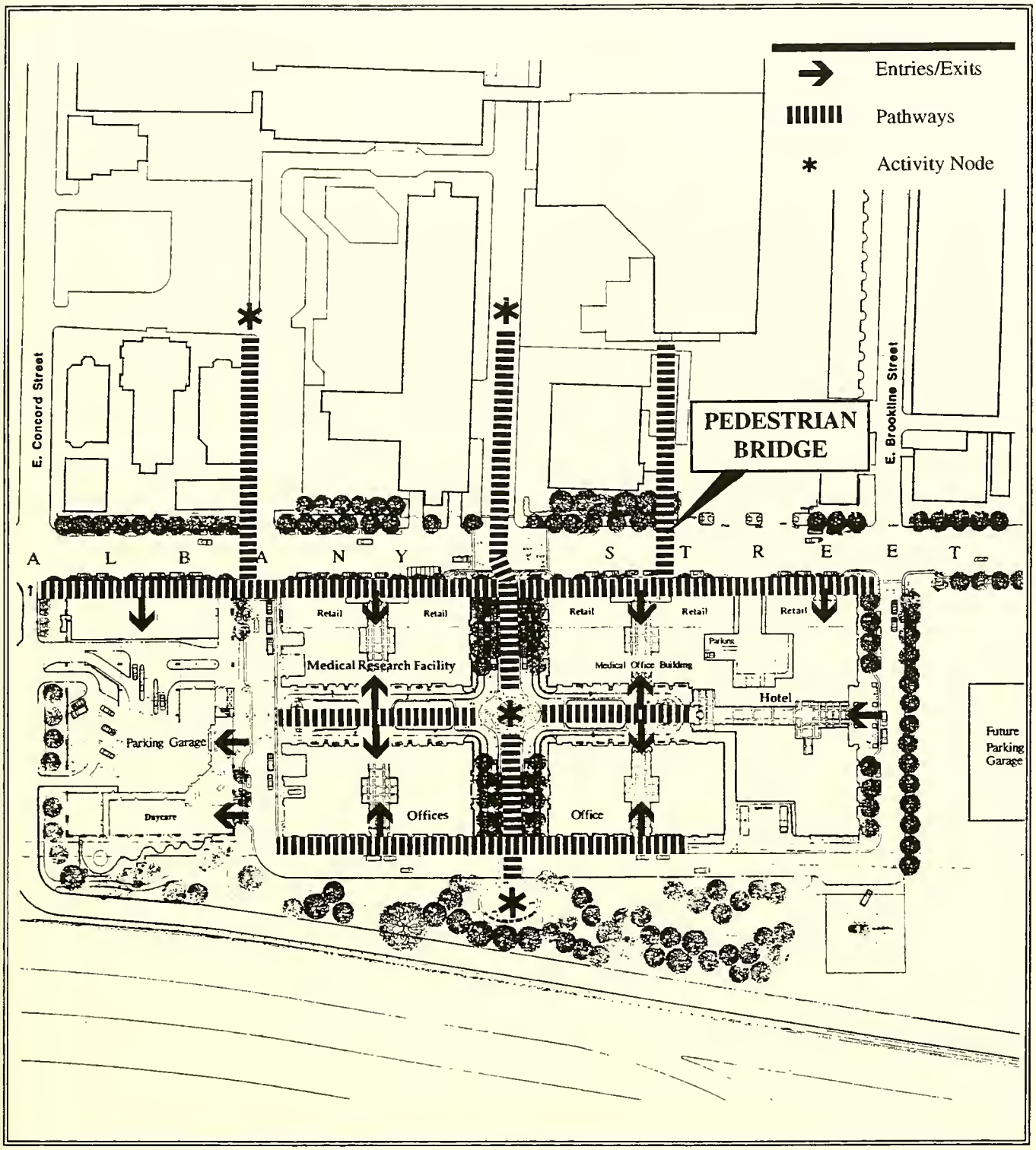
Site Circulation and Pedestrian Environment

Exhibit 6-20 illustrates the on-site pedestrian areas and pathways proposed for the University Associates development. As shown, the project will significantly improve the pedestrian environment along Albany Street, between the main campuses and the site, and within the site itself. The improvements include the following features:

- lighting--both on-site and along Albany Street
- pedestrian plaza
- street trees
- brick sidewalks
- pedestrian connector over Albany Street at second floor level
- pedestrian signals at East Newton Street.

6.3.8 LOADING AND SERVICE

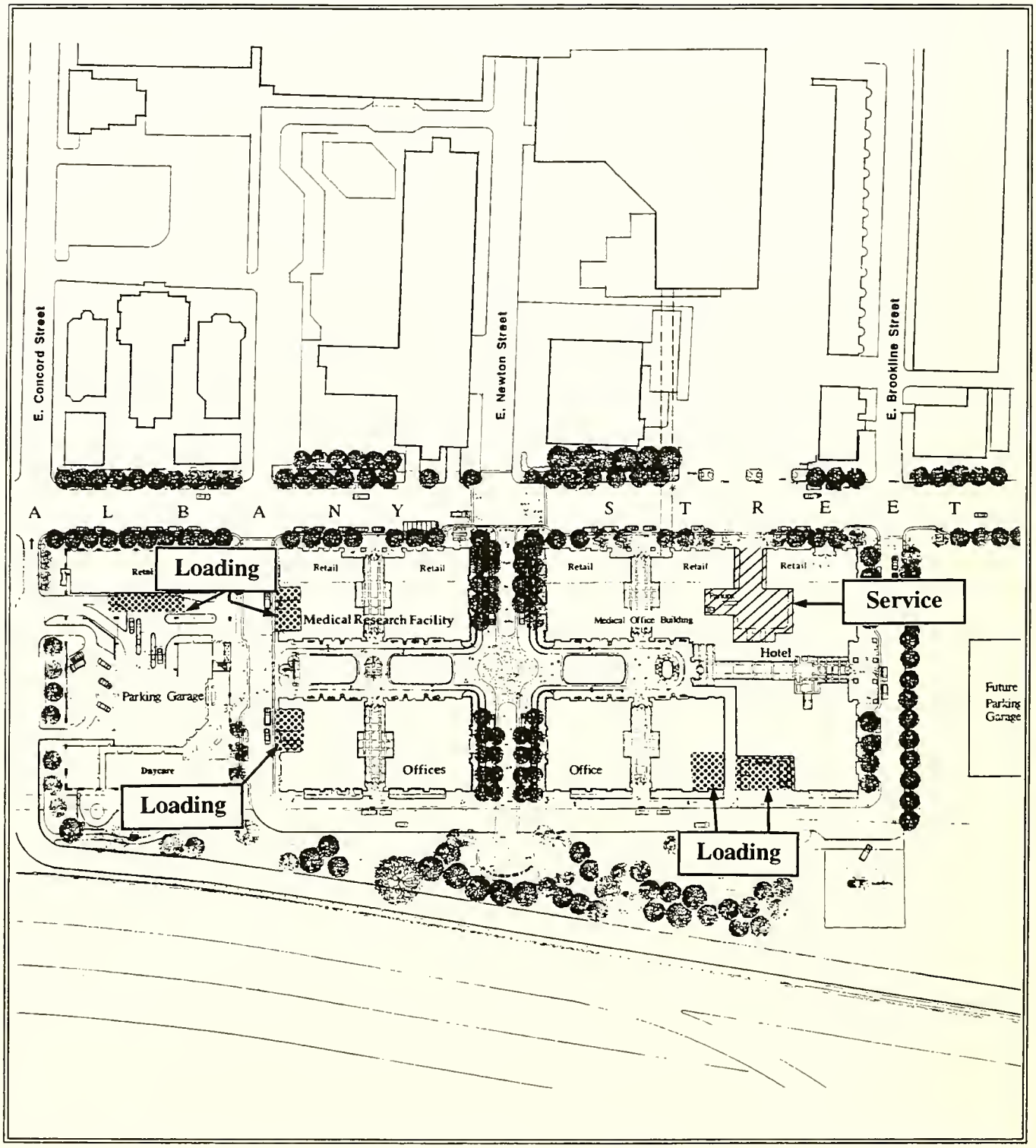
The proposed University Associates development will be served by six off-street loading and service areas as shown in Exhibit 6-21. These six areas can serve from 8 to 13 delivery vehicles at a time depending on the size of the vehicles. The proposed loading areas will be located on ground level and all activity will take place off-street. Exhibit 6-21 has been revised based on a comment on the DPIR regarding access to one of the proposed loading docks which required trucks to back into the dock from Albany Street. This loading dock has been changed to a service and drop-off area which only serves small delivery vehicles. As a result, no vehicles will be required to back into Albany Street.



Pedestrian Circulation

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 20



Loading Areas

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 21

Delivery vehicle-trip generation rates were developed from surveys conducted for the Prudential Center Redevelopment EIR[18] to determine the adequacy of the proposed loading facilities. Based on these rates, approximately 105 daily deliveries are expected for the proposed development, not all of which are expected to be new. Of these, approximately 15 percent, or 15 deliveries, are expected to arrive during each of the two daily peak delivery hours (10:00 to 11:00 AM and 1:00 to 2:00 PM). Given the anticipated level of demand, the five loading and service areas provided on-site can be managed by building operations through control of dock dwell times and delivery schedules to ensure adequate service. Building managers generally can influence these factors by scheduling deliveries, implementing vehicle-size guidelines, and providing service personnel to distribute delivered materials within the building.

Based on direct application of the formula in the Boston Zoning Code, the proposed development requires ten loading bays. As noted above, the revised project design calls for six off-street loading areas with the capacity of ten loading bays. With appropriate management, as discussed above, the loading areas should handle the expected demand.

6.3.9 CONSTRUCTION IMPACTS

Project construction activities can affect the transportation system in three ways. First, construction can increase the demand on the system: construction workers must commute to and from the job site, and construction vehicles must haul materials to and from the site. Second, it can decrease system capacity if a travel lane or a sidewalk needs to be closed to accommodate activities such as loading or unloading of construction vehicles. Third, because the development site is an existing parking area, construction activities will displace parking spaces.

The scope of this Final PIR includes analysis of the impacts of project construction activities on the transportation system. This includes an assessment of daily construction vehicle volumes and an estimation of construction worker vehicle trips. It also includes an assessment of any loss of road capacity due to on-street construction staging. Measures to mitigate the transportation impacts of construction are included in the mitigation section.

Project construction is to occur in several stages during a nine-year period through 2000. Subsequent phases will take place in increments beginning after the

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18 Prudential Center Redevelopment. Draft Project and Environmental Impact Reports. Vanasse Hangen Brustlin, Inc., April, 1989.

completion of the reconstruction of the Massachusetts Avenue Connector. The scheduling of the construction period serves to reduce daily truck volumes and construction worker trips. The construction schedule for the project will be carefully coordinated with construction schedules for the Central Artery/Tunnel project.

Construction Worker Trip Generation and Parking

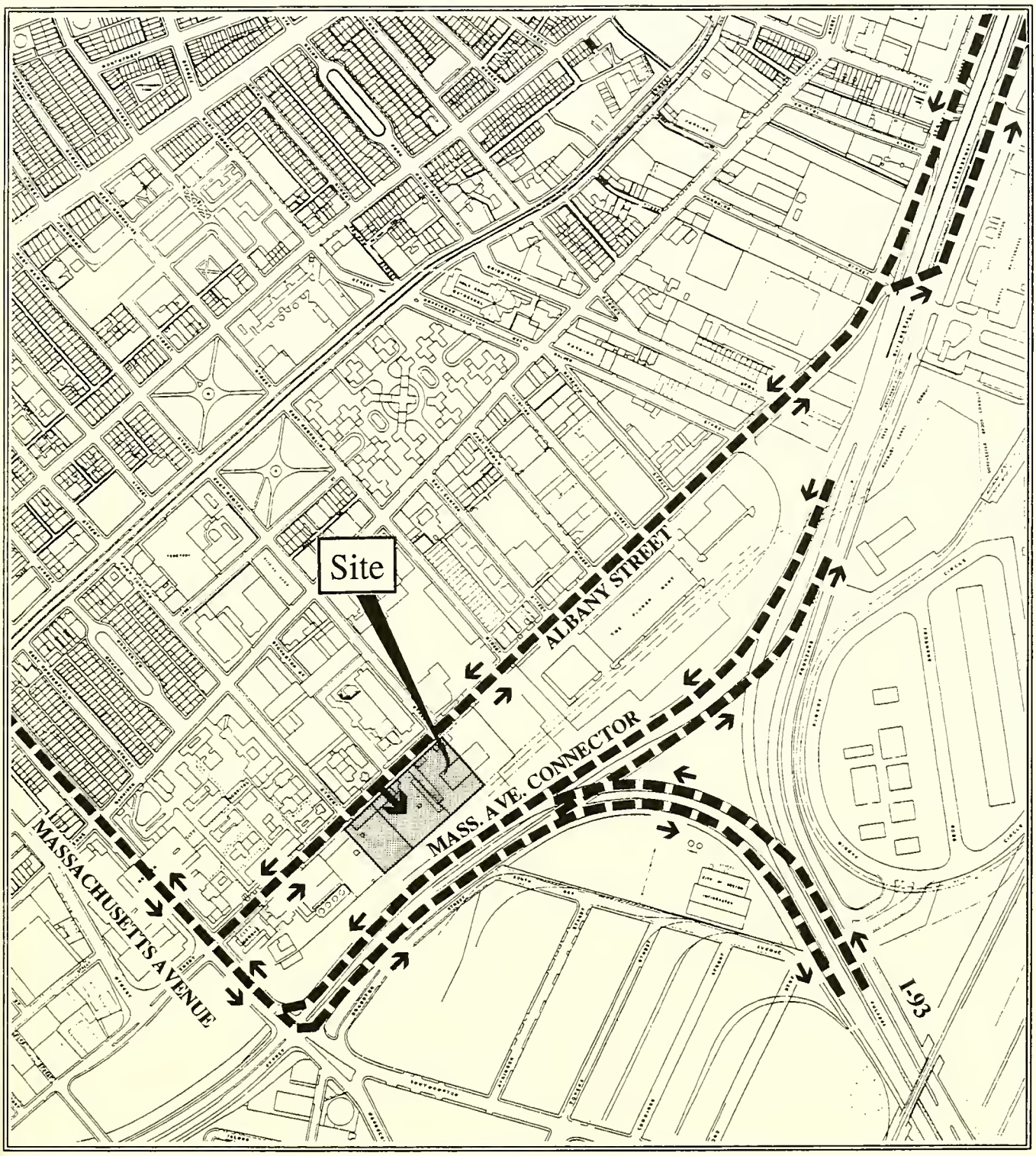
Workforce estimates for the proposed project have not yet been developed. However, based on similar size construction projects in Boston, and the proponent's estimate that no more than 180,000 square feet will be under construction at any one time, an average daily workforce of about 75 workers is expected, although the number of workers required during the construction period will vary. Trip generation by construction workers is a direct function of employment levels. It is also likely that a high percentage of workers will use public transportation because, to comply with the Mayor's Executive Order of 1985, at least 50 percent of the construction workers will reside in Boston, where use of public transportation is highest. Measures to discourage the use of automobiles by construction workers are presented in the mitigation section of this chapter.

Assuming that 60 percent of the construction workers commute by automobile, with an average auto occupancy of 1.2 persons (based on trip generation rates presented earlier in this chapter), construction workers would generate 38 vehicle trips between 6:30 and 7:00 AM and again between 4:00 and 4:30 PM. Due to the timing and relatively small number of these trips, no significant impact to the area roadway system is anticipated. Parking for construction workers will not be provided on site.

Construction Vehicle Routings and Deliveries

Specific truck routes will be mandated by the Boston Transportation Department (BTD) through a Construction Management Agreement, which is required for this project. Generally, the BTD selects routes to minimize impacts on local streets and make maximum use of available regional highways.

The exact source locations of construction materials is not known at this time, but it is expected that most, if not all, deliveries will access the site via I-93 as illustrated in Exhibit 6-22. Delivery vehicles from the south will likely exit the highway at the Massachusetts Avenue Connector. From the north, delivery vehicles will likely exit the highway at the Albany Street ramp of the Massachusetts Avenue Connector. Deliveries will be arranged to take place before 7:00 AM and between 9:00 AM and 3:00 PM.



Proposed Truck Routes During Construction

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 22

Construction Staging

Any use of public street or sidewalk space for construction staging requires a street occupancy permit from the Boston Transportation Department. The BTD generally requires developers to exhaust all on-site staging opportunities before a street occupancy permit is granted. The BTD also requires adequate provisions for a safe pedestrian movement. This is particularly important in areas where high pedestrian volumes are present.

Construction of the proposed development will be staged on-site and is not likely to require a street occupancy permit.

Conclusion

Project construction activities will require careful monitoring and mitigation to maintain traffic and pedestrian flows adjacent to the site. With appropriate mitigation measures, the impacts of the area's transportation system can be minimized.

6.4 TRANSPORTATION MITIGATION PLAN

6.4.1 INTRODUCTION

To minimize and reduce the potential impacts of the University Associates project, an extensive transportation mitigation plan has been developed that is responsive to the City of Boston Transportation Access Plan requirements. The goal is to develop a thorough mitigation plan for this important project.

In terms of traffic impacts, as noted earlier in this chapter, the project-specific impacts on intersections are limited. The improvements identified in this plan are aimed specifically at mitigating these limited impacts.

The many strategies described in this section reflect the proponent's understanding that many of the specific strategies outlined herein will be included in a legally binding Transportation Access Plan Agreement (TAPA) between the proponent and the City of Boston.

Each strategy has been classified into one of the following categories:

- Roadway and traffic control improvements
- Travel demand management
- Public transportation
- Parking management
- Loading
- Pedestrian improvements
- Construction traffic management
- Access goals and monitoring

6.4.2 MITIGATION SUMMARY

Because of the number of mitigation items, they have been summarized below prior to more detailed descriptions in this section.

Roadway and Traffic Control Improvements

- Provide funding for concept planning and engineering design to extend East Concord Street from Albany Street to the reconstructed Massachusetts Avenue Connector. This will provide improved access to the site from the regional highway system and decrease project-related traffic at other intersections
- If warranted, provide funding to design the installation of a traffic signal at the intersection of the Massachusetts Avenue Connector and the extension of East Concord Street
- If warranted, provide funding to design the installation of a traffic signal at the intersection of East Concord Street and Albany Street (with East Concord Street Extension)
- Provide funding to design the installation of a traffic signal at the intersection of Albany Street and East Brookline Street

- Seek the cooperation of the Boston Transportation Department, Boston Redevelopment Authority, and Massachusetts Department of Public Works to secure public construction funds for all roadway and traffic control improvements

Travel Demand Management

- Participate in the Interinstitutional Transportation Management Association and contribute equitably to ensure its ability to perform
- Promote ridesharing through project marketing efforts
- Implement a computerized rideshare program
- Establish a public awareness program on transportation options
- Establish a preferential parking program for carpools and vanpools
- Sponsor a semi-annual "Transportation Awareness Day"
- Promote bicycle transportation and provide secure bicycle parking
- Encourage employers to implement alternative work schedules
- Promote increased usage of public transportation services

Public Transportation

- Evaluate the expansion of bus service between the Red and Orange Lines via Melnea Cass Boulevard
- Coordinate with the MBTA and others to assist in the installation of bus shelters and improvements to transit information signage
- Continue to offer transit pass subsidies to University Hospital employees
- Coordinate with the MBTA in the promotion of public transportation

Parking Management

- Manage the parking supply to ensure parking is available for patients and visitors
- Provide adequate parking for disabled persons

Loading

- Require all commercial deliveries to be made at off- street docks
- Discourage commercial deliveries during commuter peak periods
- Provide sufficient off-street space to prevent on-street truck backing or queuing
- Properly manage loading areas

Pedestrian Improvements

- Provide pedestrian lighting on-site and along Albany Street
- Provide full accessibility to disabled persons on-site
- Provide a pedestrian connector bridge over Albany Street

Construction Traffic Management

- Coordinate with BTD in the creation and implementation of a construction traffic management plan and coordinate construction sequencing with the MDPW's reconstruction of the Central Artery
- Designate truck routes
- Provide covered pedestrian walkways
- Provide adequate on-site storage areas for construction materials
- Encourage construction workers to use public transportation
- Provide truck waiting areas

- Provide police officer traffic management
- Coordinate with city agencies to minimize and manage construction parking impacts

Access Goals and Monitoring

- Implement a transportation monitoring program in response to the Boston Transportation Department's requirements

The following sections further describe each mitigation measure.

6.4.3 ROADWAY AND TRAFFIC CONTROL IMPROVEMENTS

This section discusses a series of proposed mitigation measures to improve traffic operations at several intersections and along key corridors within the study area.

Extend East Concord Street to the Reconstructed Massachusetts Avenue Connector

By extending East Concord Street out to the reconstructed Massachusetts Avenue Connector, improved access to the site and area institutions from the regional highway system would be provided. Exhibit 6-23 shows the location of the East Concord Street Extension as it relates to the parking garage. This improved access will decrease a significant amount of project-related and some non-project institution-related traffic at a number of intersections along Massachusetts Avenue and Albany Street. The proposed design of this street incorporates the following:

- Signalization of the East Concord Street Extension and Massachusetts Avenue Connector intersection
- Signalization of the East Concord Street Extension and Albany Street intersection if warranted
- Provision of two-way access/egress between the Massachusetts Avenue Connector and the proposed garage only
- Provision of one-way egress only from the garage entrance to Albany Street. Motorists exiting onto Albany Street would be required to turn right or left onto Albany Street. Motorists would not be permitted to cross Albany Street since East Concord Street is one-way eastbound from Harrison Avenue to Albany Street

In order to measure the effect of the proposed East Concord Street Extension, traffic volume shifts were estimated. The following assumptions were made regarding the travel patterns of motorists traveling to the site:

- Motorists traveling to all three institutions from the south via I-93 would exit onto the Massachusetts Avenue Connector via the Frontage Road system to access the garage or Albany Street. Only motorists exiting from the garage would use this route in reverse

- Approximately twenty-five percent of employees of Boston University Medical Center or those working on the site itself who would be parking in facilities accessible from Albany Street located opposite East Brookline Street would use East Concord Street Extension. These employees would turn right onto Albany Street in order to access other parking areas

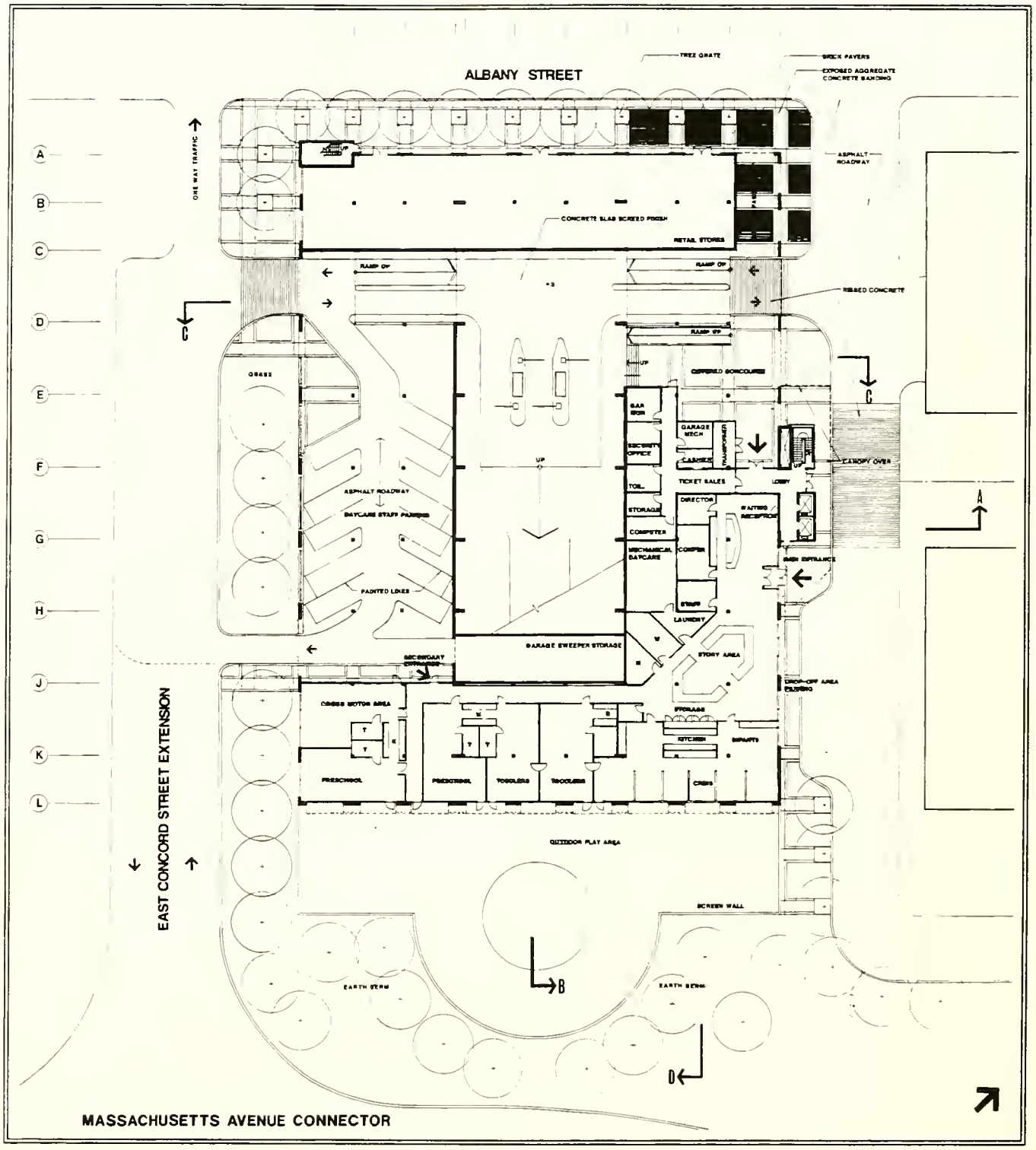
Because it was desirable to limit the potential for motorists to use the East Concord Street Extension as a cut-through street in order to bypass Massachusetts Avenue and still provide improved access to the site and the adjacent institutions, a number of alternatives were considered before the East Concord Street Extension described above was chosen as the best alternative. These alternatives included:

1. Reversing the direction of traffic flow on East Concord Street between Albany Street and Harrison Avenue

2. Reversing the direction of traffic flow on East Concord Street between Harrison Avenue and Washington Street

A few motorists might use the East Concord Street Extension to turn right onto Albany Street and then left onto East Newton Street as a way to bypass Massachusetts Avenue. Such diversion should be minimal, however, because the CA/T project will improve access to the south and west both from Massachusetts Avenue and from the Frontage Road system, motorists will not experience a time savings advantage by using this local route as a shortcut to other destinations in Boston.

Exhibits 6-24 and 6-25 show the projected 2000 Build traffic volumes for the morning and evening peak hours, respectively, with the extension of East Concord Street in place.



East Concord Street Extension and Garage Floor Plan

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 23

In response to a comment made by the MDPW, an additional analysis was conducted on a modified version of the mitigation proposal presented in the DEIR/DPIR to extend East Concord Street to the Massachusetts Avenue Connector. The modification would connect East Concord Street only to the westbound lanes of the Massachusetts Avenue Connector (i.e., the Connector would have an unbroken median at the Extension). This configuration would only allow right turns into and out of the proposed East Concord Street Extension.

The implementation of a right-turn-in/right-turn-out restriction for the Massachusetts Avenue Connector at the East Concord Street Extension intersection would affect motorists leaving the 1,000-space garage during the evening peak hour. Motorists destined for I-93 north would turn right onto and travel north on Albany Street, cross under the expressway and enter the expressway from the northbound Frontage Road. Motorists destined for I-93 south would turn right onto the Massachusetts Avenue Connector from East Concord Street Extension, turn left onto Massachusetts Avenue and enter the expressway via the Southampton Street ramp. These traffic volume shifts will add traffic to the northbound approach of all intersections along Albany Street and to the southbound left turn at the Massachusetts Avenue Connector/Melnea Cass Boulevard intersection.

A comparison of the LOS was made for evening peak hour traffic with and without the right-turn-only restriction. This comparison was made for the intersections of the Massachusetts Avenue Connector with East Concord Street Extension and with Melnea Cass Boulevard. These results are shown in Table 6-22. As shown, with the right-turn-only restriction in place, the intersection of Massachusetts Avenue Connector and Melnea Cass Boulevard continues to operate at LOS F, with an increase in the volume-to-capacity ratio from 1.08 to 1.15. The intersection of the Massachusetts Avenue Connector and East Concord Street Extension, forecast to operate at LOS B with all movements permitted, would operate at LOS A with the right-turn restriction.

The addition of left turns to the southbound approach to the Massachusetts Avenue/Melnea Cass Boulevard intersection is less desirable since this intersection is estimated to operate deficiently under current and future conditions.

It would be preferable to reduce rather than increase traffic at the Massachusetts Avenue/Melnea Cass Boulevard intersection. Quick access between area trip generators and the regional highway system via the Massachusetts Avenue Connector would reduce unnecessary travel on local streets to the greatest extent possible.

Table 6 - 22
LEVEL-OF-SERVICE COMPARISON WITH AND WITHOUT RIGHT-TURN-ONLY RESTRICTION - EVENING PEAK HOUR

	With Right-Turn-Only Restriction*			Without Right-Turn-Only Restriction*		
Intersection	V/C**	Delay***	LOS+	V/C**	Delay***	LOS+
Massachusetts Avenue Connector and East Concord Street Extension	0.68	3	A	0.79	7	B
Massachusetts Avenue Connector and Melnea Cass Boulevard	1.15	60+	F	1.08	60+	F

*With East Concord Street Extension in place.
**Volume-to-capacity ratio.
***Average stopped delay per vehicle in seconds.
+Level of service.

Source: Vanasse Hangen Brustlin, Inc.

Support the installation of a Critical Intersection Control (CIC) system at the intersection of Massachusetts Avenue and Melnea Cass Boulevard.

Based on comments made on the DPIR, this intersection has been further studied to identify additional measures to improve intersection operations. From this review, which included field observations and discussions with representatives of the Boston Transportation Department, it was learned that this intersection is not under the BTD's Critical Intersection Control (CIC) system. CIC is a vehicle detection system that instantaneously responds to traffic demands. The CIC system hardware consists of traffic detector loops located approximately 200 feet from the stop line on each approach. These detectors measure the traffic demand at each approach and adjust the signal phasing accordingly on a cycle-by-cycle basis. With the CIC system in place, traffic volumes can be better managed during high- demand periods.

Installation of the CIC system at this intersection appears to be the most effective way to mitigate the poor level of service that the intersection currently experiences during the evening peak hour and is predicted to experience in the future during both peak hours under No-Build and Build conditions. Maintenance and durability of the CIC system hardware is improved because the detectors are placed in the

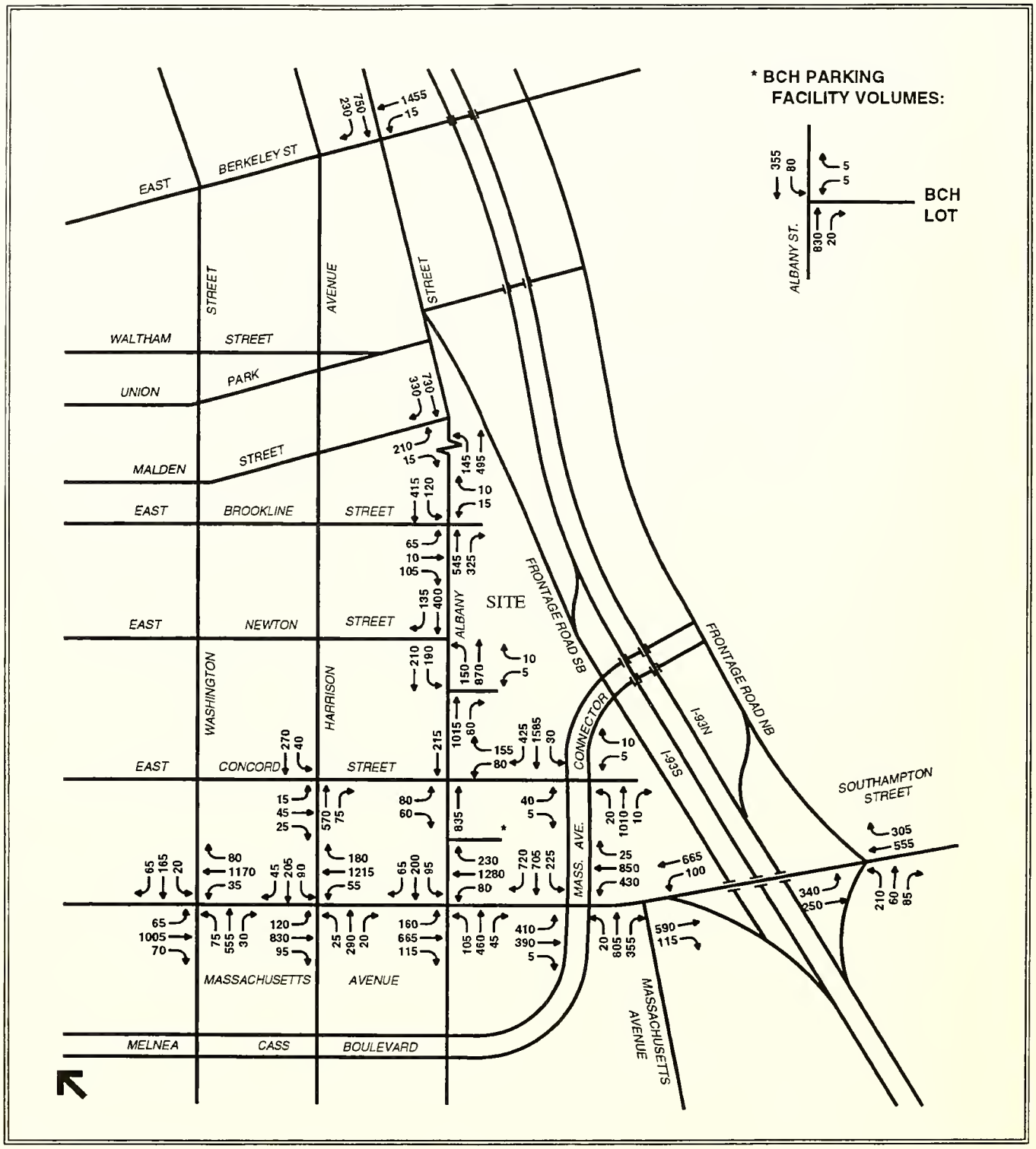
pavement farther away from the stop line and are not subjected to the pavement rippling effect that can damage the stop-line detectors.

Signalize the Intersection of Albany Street and East Brookline Street

Due to the large number of vehicles accessing both the site and the existing surface parking at the driveway on Albany Street across from East Brookline Street, a traffic signal may be needed at this intersection to improve its operation. Under No-Build and Build conditions, this intersection is unsignalized. Under Build Mitigated conditions, this intersection is assumed to be signalized.

The future intersection level of service was analyzed as summarized in Tables 6-23 and 6-24. These tables compare level-of-service results for unmitigated No-Build and Build (i.e., no signalization and no extension of East Concord Street) with the mitigated Build condition (i.e., with the improvements in place) at several of the critical affected intersections.

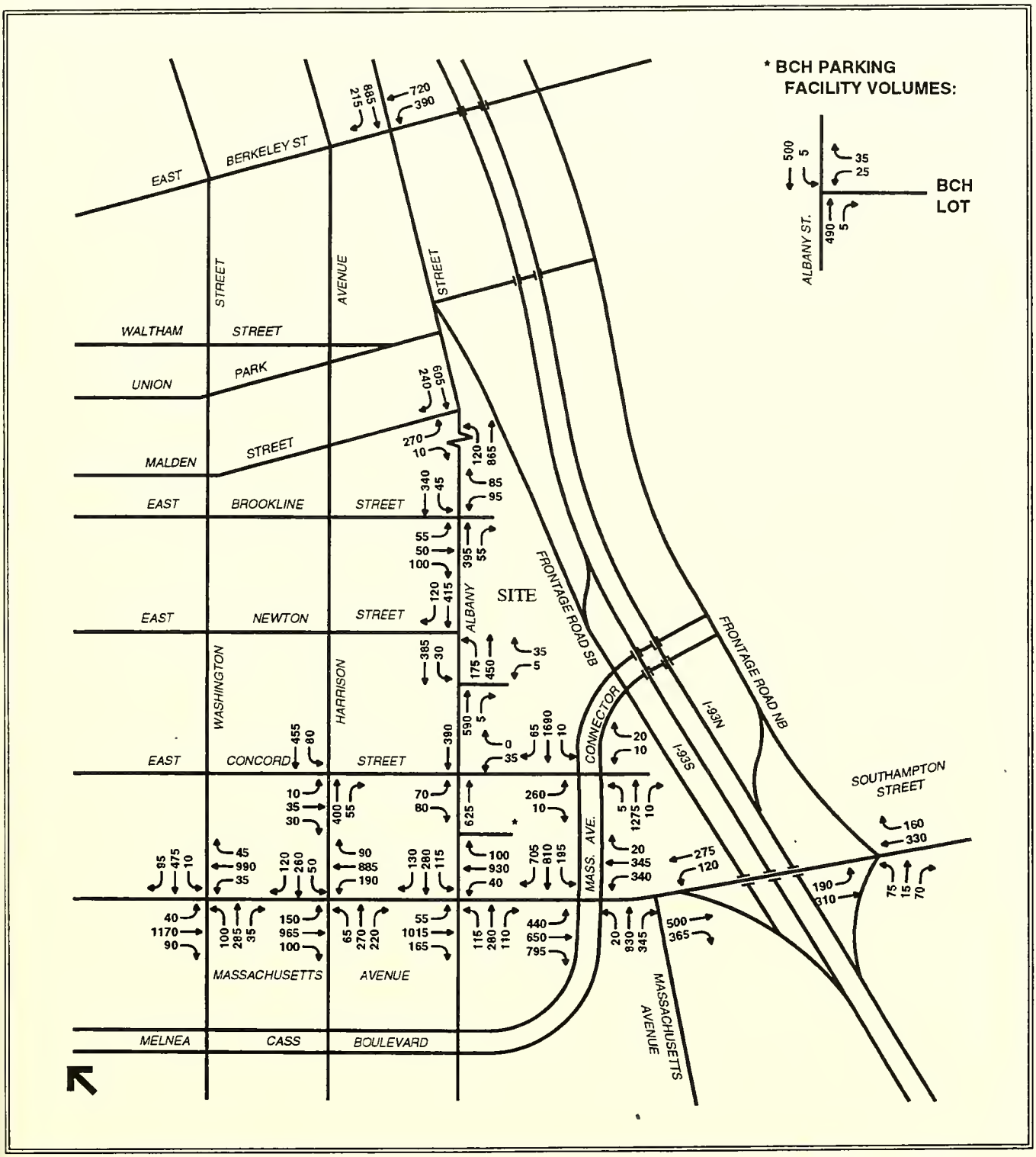
As shown in Tables 6-23 and 6-24, the extension of East Concord Street to the Massachusetts Avenue Connector and the signalization of the intersections of Albany Street at East Brookline Street and Albany Street at East Concord Street significantly improve the level of service under Mitigated Build conditions. As unsignalized intersections under Build conditions, certain critical movements are forecast to operate at LOS E or F during both the morning and evening peak hours. When signalized, the intersection of Albany Street and East Brookline Street is projected to operate at LOS B during both peak hours, and the intersection of Albany Street and East Concord Street is forecast to operate at LOS A. The intersection of Massachusetts Avenue and Albany Street is expected to have improved level of service as a result of mitigation (from LOS D to LOS C in the morning and from LOS F to LOS C in the evening). During the evening peak hour, the intersection of Massachusetts Avenue and Melnea Cass Boulevard, which is forecast to operate at LOS F under No-Build and Build conditions, is not improved by the proposed East Concord Street Extension. During the morning peak hour, this intersection should improve from LOS E to LOS D as a result of mitigation.



2000 Build Mitigated Morning Peak Hour Traffic Volumes

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 24



2000 Build Mitigated Evening Peak Hour Traffic Volumes

Prepared By:
Vanasse Hangen Brustlin, Inc.

Exhibit 6 - 25

Table 6 - 23
MORNING PEAK HOUR INTERSECTION LEVEL-OF-SERVICE WITH MITIGATION

Intersection Number	Location	2000 No-Build V/C*	2000 No-Build Delay**	2000 No-Build LOS***	2000 Build V/C	2000 Build Delay	2000 Build LOS	2000 Build Mitigated V/C	2000 Build Mitigated Delay	2000 Build Mitigated LOS
3	Albany Street and East Brookline Street	---	---	(E)	---	---	(F)	0.74	6	B
5	Albany Street and East Concord Street	---	---	(D)	---	---	(E)	0.59	4	A
9	Mass. Ave. and Albany Street	0.79	20	C	1.07	31	D	0.82	22	C
10	Mass. Ave. and Melnea Cass Blvd.	0.95	40	E	1.07	49	E	0.96	37	D
13	Mass. Ave. Conn. and East Concord Street	---	---	---	---	---	---	0.73	4	A

*Volume-to-capacity ratio.
**Average stopped delay per vehicle in seconds.
***Level of service.
( )Unsignalized intersection analysis results.

Source: Vanasse Hangen Brustlin, Inc.

Table 6 - 24
EVENING PEAK HOUR INTERSECTION LEVEL-OF-SERVICE WITH MITIGATION

Intersection Number	Location	2000 No-Build V/C*	2000 No-Build Delay**	2000 No-Build LOS***	2000 Build V/C	2000 Build Delay	2000 Build LOS	2000 Build Mitigated V/C	2000 Build Mitigated Delay	2000 Build Mitigated LOS
3	Albany Street and East Brookline Street	---	---	(D)	---	---	(E)	0.41	6	B
5	Albany Street and East Concord Street	---	---	(C)	---	---	(F)	0.40	4	A
9	Mass. Ave. and Albany Street	0.87	51	E	0.86	60+	F	0.78	17	C
10	Mass. Ave. and Melnea Cass Blvd.	1.07	60+	F	1.09	60+	F	1.08	60+	F
13	Mass. Ave. Conn. and East Concord Street	---	---	---	---	---	---	0.79	7	B

*Volume-to-capacity ratio.
**Average stopped delay per vehicle in seconds.
***Level of service.
( )Unsignalized intersection analysis results.

Source: Vanasse Hangen Brustlin, Inc.

6.4.4 TRAVEL DEMAND MANAGEMENT IMPROVEMENTS

Reducing the amount of traffic generated by the University Associates development is an integral part of the mitigation plan. University Associates has developed a series of travel demand reduction strategies to reduce the impacts of the project. When integrated into a comprehensive transportation management plan, travel demand management can reduce automobile usage and, thereby, lessen the need for physical improvements to roadways and reduce the need for parking. The measures that are designed to reduce the number of vehicle trips to the project area during

peak commuting hours and on a daily basis are described in the following paragraphs.

Interinstitutional Transportation Management Association

The University Hospital, Boston University Medical Campus, and Boston City Hospital have developed an Interinstitutional Transportation Management Association (ITMA). The ITMA will be responsible for addressing the development's transportation plan, including identifying and responding to transportation-related issues and concerns. The specific objective is to implement measures that minimize automobile use to and from the area. To accomplish this, the ITMA through its Transportation Coordinator will:

- Coordinate ridesharing (car and vanpooling) activities
- Promote transportation options through periodic newsletters, special events, publicity, and tenant relations
- Encourage the institutions and new tenants to implement alternative work schedules to spread peak- hour travel
- Participate in the establishment of access plan goals, monitor efforts, and submit periodic reports to the city on compliance levels and mitigation effectiveness
- Provide up-to-date information on transit services, schedules, fares, etc. for project tenants and shoppers
- Act as the main contact vehicle for all outside agencies and groups on transportation matters

Promote Ridesharing Through Project Marketing Efforts

Ridesharing, where commuters participate in carpools and vanpools, decreases the number of vehicles using area roadways and, thereby, reduces congestion, air pollution, and fuel consumption. University Associates is strongly committed to promoting the concept of ridesharing. This will be done through a series of marketing efforts. Project employees as well as visitors and other users will be targeted in this campaign.

Implement a Computerized Rideshare Program

The Commonwealth of Massachusetts, through the funding of a private, non-profit corporation (CARAVAN for Commuters, Inc.), has developed a computerized transportation ride-matching network called RideSource. RideSource matches commuters to carpools, vanpools, and public transportation options through an extensive database developed by CARAVAN. University Associates will develop a site-specific database with the assistance and support of CARAVAN. This computerized tool will greatly assist in the formation of carpools and vanpools by making data available to employees about the residence location and travel times of other commuters who might share a ride. To further encourage the use of vanpools, tenants will be informed about the advantages of vanpools and the opportunities to support them through CARAVAN and other similar programs. Currently, CARAVAN has assigned a part-time staff person who has assisted the ITMA in becoming organized and securing funding.

Establish a Public Awareness Program on Transportation Options

University Associates will disseminate promotional materials on all transportation modes for project employees through a comprehensive public awareness campaign. This program will be the responsibility of the ITMA's Transportation Coordinator and will include a regularly published and distributed newsletter addressing ridesharing, public transit, and other opportunities to reduce vehicular travel demand.

Establish a Preferential Parking Program for Carpools and Vanpools

University Associates will support ridesharing by establishing a preferential parking program for carpools and vanpools. This will also include a discount for vanpool parking spaces, creating an even greater incentive to use this mode of travel.

Sponsor a Semi-Annual Transportation Awareness Day

To promote the use of alternate means of travel to the site, University Associates will hold a semi-annual "Transportation Awareness Day." This event will include exhibits, special displays, promotional materials, and video presentations on alternative transportation services available to people traveling to the project. Information will also be provided on carpooling, vanpooling, and public transportation. University Associates will work with the MBTA, the BTD, and CARAVAN to plan the event.

Promote Bicycle Transportation and Provide Secure Bicycle Parking

The developer recognizes the positive (though minimal) traffic reduction benefits from encouraging the use of bicycle transportation for traveling to the project. Therefore, the plan will establish areas that make cyclists comfortable leaving their bikes and, thereby, may encourage this mode of transportation. Providing a bike storage area in the garage is one possible option. These locations will be close to security staff or parking attendants to provide added security.

Encourage Employers to Implement Alternative Work Schedules

Alternative work schedules offer a means of reducing peak hour travel demands on the roadway and transit systems by shifting travel to non-peak periods or by reducing the total number of trips made per week. The major schedule alternatives are:

- Staggered Work Hours. Generally set up in such a way as to assign groups of employees staggered starting times, typically at 15-minute intervals, spread over a one or two-hour period

- Flexible Work Hours (Flextime). Allow employees to choose their own starting and finishing times, as long as they are present during the central part of the day (called core time)

- Compressed Work Week. Involves shifting some workers from a standard five days per week, eight hours per day schedule to fewer days of longer hours (e.g., four days per week, ten hours per day)

University Associates will encourage project tenants to establish alternative work hours programs. It shall be noted that medical uses tend to have schedules which have a smaller impact on the traditional commuter peak hours.

Promote Increased Usage of Public Transportation Services

An effective way to reduce the number of vehicles on the roadways serving the site is to strongly encourage employees to use public transportation as an alternate means of traveling to work. University Associates is firmly committed to increased use of public transportation and will encourage and promote transit usage for employees and visitors.

6.4.5 PUBLIC TRANSPORTATION

Measures will be implemented that enhance access to nearby public transportation facilities for project tenants, employees, and visitors. These enhancements are designed to increase the percentage of trips made via public transportation to the site by making use of these systems easier and more attractive.

Evaluate the Expansion of Bus Services Between the Red and Orange Lines via Melnea Cass Boulevard

Melnea Cass Boulevard is an arterial street providing connections from Columbus Avenue to Massachusetts Avenue and the Massachusetts Avenue Connector. This street has an existing, separate, right-of-way that could be used for a bus-only lane. One alternative available to improve the connection to the site from the Ruggles Orange Line MBTA station is to improve bus service along this route. Exhibit 6-26 provides an illustration of this route which could also serve the Broadway Red Line MBTA station. Several employers and development sites have the potential to benefit from such an improved service, including Gillette, University Associates, Boston University Medical Campus, The University Hospital, Boston City Hospital, and Parcel 18 shown on Exhibit 6-26. University Associates, in coordination with Metropolitan Structures (developers of Parcel 18), is funding a study of this improved transit service.

That study will analyze existing conditions, and in particular ridership on existing Routes 47 and 10, which provide the Red Line and Ruggles Station Orange Line connections today. This will involve a brief interview at bus stops, boarding and alighting counts on the various MBTA and employer shuttle routes to the Orange and Red Lines, and travel time studies. In the second part of the study, a route and headways for the new service will be established, as well as suggestions to modify existing MBTA and employer shuttle bus routes, which will be developed in cooperation with the MBTA. Operating characteristics, travel time, ridership, and cost/benefit estimates will be developed for the proposed bus route and the alternatives. Should a preferred route be agreed upon by the ITMA members and the MBTA, costs for a short-term demonstration will be developed. Comparative costs for MBTA operation versus private operation will also be developed. If the transit service proves feasible, the ITMA will work with the MBTA and others to assist in the installation of bus shelters, improvements to transit information signage, and development of other strategies to encourage transit use.

Coordinate With the MBTA in the Promotion of Public Transportation

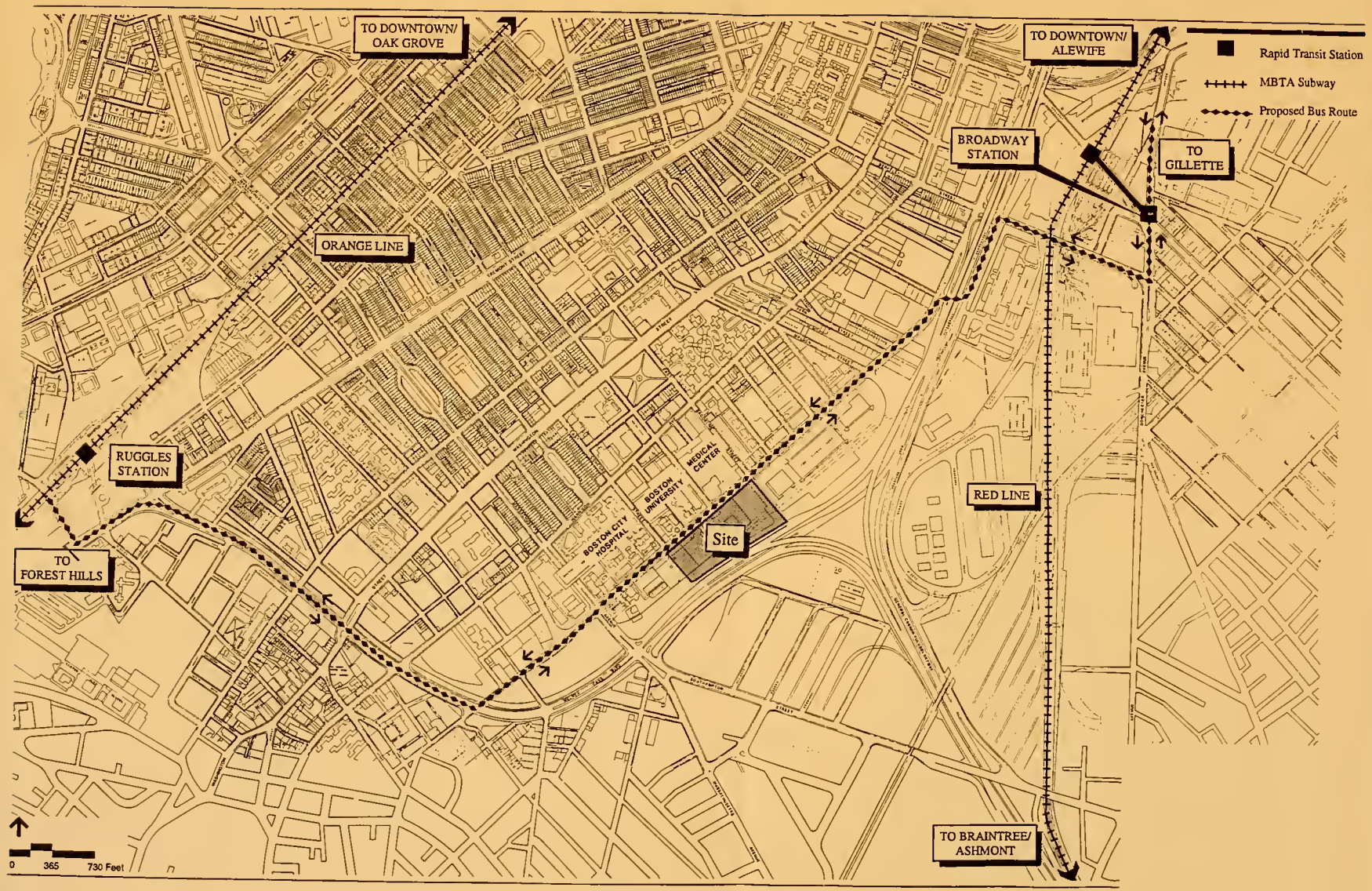
University Associates will coordinate with the MBTA to identify other public transportation initiatives that are likely to have a beneficial impact in reducing project area vehicle trips.

6.4.6 PARKING MANAGEMENT

A major feature of the project's mitigation program is the implementation of strategies to manage the parking facility in a manner that supports the other elements of the mitigation program. In particular, this involves implementing the many mitigation measures that discourage workers and visitors from driving alone. As stated earlier, some of these measures are establishing vanpool and carpool programs and discouraging all-day parking with pricing policies. The developer's intent is to provide adequate parking for those who must drive to the site, while at the same time providing incentives for those who can rideshare or use public transportation.

Manage the Parking Supply to Ensure Parking is Available for Patients and Visitors

As described earlier in this chapter, the project includes at least two parking structures and a total of 1,031 new spaces on the site. To ensure that the short-term parking needs are satisfied, the parking system will be managed to hold in reserve a minimum number of spaces (to be determined) to provide adequate and convenient parking for patients and visitors.



UNIVERSITY ASSOCIATES

Suggested New Bus Route

Exhibit 6- 26

Prepared by:
Vanasse Hangen Brustlin, Inc.

NOVEMBER 1991

Provide Adequate Parking for Disabled Persons

University Associates will provide parking spaces for the disabled throughout the site as the parking management plan is implemented. The project will be in full compliance with the Commonwealth's Architectural Access Board (AAB) standards and the Federal Americans with Disabilities Act.

6.4.7 LOADING

A sometimes overlooked part of a project's mitigation plan is in the area of loading, including the configuration of loading docks and service vehicle parking as well as the movement patterns for these vehicles. The measures below are designed to address these issues.

Require All Commercial Deliveries to be Made at Off Street Docks

The city's current policy is to require off-street loading, and it is University Associate's intention to comply with this policy. See the discussions on the Probable Project Impacts Loading section.

Discourage Commercial Deliveries During Commuter Peak Periods

University Associates is committed to working with the Boston Transportation Department to manage and control truck deliveries. The goal is to encourage midday, off-peak hour usage whenever possible.

Provide Sufficient Off-Street Space to Prevent On Street Truck Backing or Queuing

All loading and service vehicle parking areas are provided off-street. Their location insures that there will be no impact on the local street system in terms of truck backing or queuing.

Properly Manage Loading Areas

The six loading and service areas provided on-site can be managed by building operations through control of dock dwell times and delivery schedules to ensure adequate service. Building managers generally can influence these factors by scheduling deliveries, implementing vehicle-size guidelines, and providing service personnel to distribute delivered materials within the building.

Based on direct application of the formula in the Boston Zoning Code, the proposed development requires ten loading bays. As noted earlier, the project design calls for four off-street loading areas with the capacity of eight to thirteen bays depending on delivery vehicle size. With appropriate management, the loading areas should handle the expected demand, thus satisfying the intent of the zoning code.

6.4.8 PEDESTRIAN IMPROVEMENTS

Provide Pedestrian Lighting On-Site and Along Albany Street

The project is designed to include well lighted public and pedestrian areas. Pedestrian-scale lighting is located along all streets and accent lighting is located in all plazas, courtyards, and exterior project walkways for security. Mounted lighting is located at all project and building entrances.

Provide Full On-Site Accessibility to Disabled Persons

The design plans for the project also include major improvements to on-site circulation. Planning guidelines, where existing grades permit, require at grade accessibility allowing free movement by individuals with physical handicaps. Where grade does not permit, ramps will be provided for barrier free access to exterior spaces. Elevators and ramps, where appropriate, provide for barrier free interior access for the physically disabled.

Provide Pedestrian Connector Bridge over Albany Street

The design plans for the project include a pedestrian connector bridge over Albany Street to University Hospital. This bridge will increase pedestrian safety by decreasing the number of at-grade pedestrian crossings along Albany Street.

6.4.9 CONSTRUCTION TRAFFIC MANAGEMENT

An important component of the Transportation Access Plan is the creation of effective measures designed to safely accommodate vehicular and pedestrian traffic flow during the project's construction. Summarized below are several measures that University Associates and the construction contractors will incorporate into the construction traffic management plan and the construction mitigation agreement for the project. University Associates will also assign a staff person to ensure that the identified commitments are enforced.

Define a Construction Traffic Management Plan

A master construction traffic management plan will be developed with the city. It will detail the specific commitments to be followed by the developer and the construction contractors throughout all phases of the project and will be considered as a legally binding document.

Designate Truck Routes

Designated truck routes will be established to govern how trucks reach the site. The main point of this commitment is to have trucks use only the regional highway system and major arteries and avoid using residential streets and historic districts. Enforcement of these restrictions will be accomplished through signage and contractual clauses in each contractor and subcontractor agreement.

Provide Covered Pedestrian Walkways

Secure fencing, staging, and bracing will be provided in areas affected by each phase of construction to protect nearby pedestrian and vehicular traffic, and to improve safety. Gate entrances into each construction area will be determined jointly with the MBTA and the BTD.

Provide Adequate On-Site Storage Areas for Construction Materials

The location of lay down and storage areas will be established to minimize area disruption and confusion. It appears that there will be opportunities for the creation of these areas throughout the site. At this point, it appears that the need for the construction contractor to be physically located on city streets will be quite limited. The peripheral locations will also likely serve as staging areas for many of the more internal areas of the site where construction will be occurring.

Encourage Construction Workers to Use Public Transportation

Construction workers will be encouraged to access the site by public transportation or ridesharing. It is planned that the construction contract agreements signed by the owner and the contractor will include specific language encouraging workers not to drive to the site. At the same time, construction worker shifts will be scheduled to avoid impacts on the commuter rush hours as much as possible. With the usual hours for construction occurring between 7:00 AM and 3:30 PM, traffic and transit impacts will occur during non-system peak hours, reducing project impacts.

Provide Truck Waiting Areas

Truck waiting areas will be designated to avoid creating impacts on adjacent areas. Further, the use of an off-site truck marshalling area for major events such as large concrete pours will be investigated.

Provide Police Officer Traffic Management

Police officer traffic control may be necessary through most early phases of construction. The need for police officers will be determined jointly with the BTD and provided as required. Detail officers on assignment in the construction zone will be responsible for maintaining a safe and orderly flow of vehicles and pedestrians, as well as responding to any unforseen events. Emergency vehicle access to the site will be assured throughout the entire construction process.

Coordinate With BTD in the Creation and Implementation of a Construction Traffic Management Plan and Coordinate Construction Sequencing With the MDPW's Reconstruction of the Central Artery

University Associates will work with the Boston Transportation Department, along with other agencies such as the MBTA, the BRA, and the MDPW as well as area land owners and businesses to develop the construction traffic management plan mentioned above. The goal will be to create a comprehensive and realistic plan that is sensitive to the needs of those likely to be affected by project construction activities. Construction sequencing will be coordinated with the reconstruction of the Central Artery. Specifically, because the CA/T project will displace several hundred parking spaces, the sequencing of each phase of development will ensure that parking impacts are minimized.

Coordinate with City Agencies to Minimize and Manage Parking Impacts

The proponent has undertaken separate discussions with several city agencies with respect to parking impacts during construction. This process will continue so as to ensure that adequate parking is available during all phases of the development.

6.4.10 ACCESS GOALS AND MONITORING

Implement a Transportation Monitoring Program in Response to the Boston Transportation Department's Requirements

In a previous section, detailed estimates of the amount of vehicle-trip generation were made, based on several combined factors. The most significant factors affecting the number of vehicle trips to the site are:

- Percent transit use (share of project generated person-trips using public transportation)
- Vehicle occupancy rate (average number of people in each vehicle coming to or leaving the project)
- Peak hour percentage (portion of total project trips made during the peak commuting hour)

To minimize the amount of automobile travel to the site, it is desirable to increase the number of trips by public transportation and to increase the vehicle occupancy rate of those vehicles traveling to the site. It is also beneficial to decrease the peak hour travel percentage through various peak spreading techniques described earlier. These factors serve as a basis for establishing a set of access goals for the project.

Table 6-25 lists the trip generation factors for the proposed development, along with the values assumed for project- generated trips in the earlier section of this document. Changes in the value of each factor may be considered as measures of effectiveness for the proposed mitigation actions. The top portion of the table lists the numerical values of the key factors used in the unmitigated analysis and the revised factors, which assume the mitigation program is in place during 2000 (Full-Build) analysis condition. The lower part of the table shows both the originally expected, net new vehicle trip generation and the revised estimates, which assume the mitigation plan is in place.

As indicated in the table, mitigation measures reduce project-generated vehicle trips in the peak direction by approximately 94 vehicles (24 percent) in the morning peak hour and 75 vehicles (21 percent) in the evening peak hour. Transit trips remain about the same in the morning and evening peak hours due to the combined effect of increased transit usage and the peak hour spreading effect of alternative work schedules.

As a follow up to the setting of the access goals listed above, University Associates is prepared to provide periodic management reports to the city on the project's compliance with the stated goals and objectives, as well as other areas of the access plan. To accomplish this, the proponent will conduct periodic surveys of employees and other users of the development. These surveys will be used to assist in determining trip generation rates, travel mode splits, vehicle occupancy rates, peak hour travel percentages, and parking data. Additionally, data on trip origins and destinations will be gathered as part of the survey work. These data will be collected after consultation with the BTD and in accordance with the BTD's guidelines.

Table 6 - 25
ACCESS PLAN GOALS

Trip Generation Factors	Analysis Estimates	Mitigation Action	Goal
Percent by Auto Incentives	60%	Transit	55%
Vehicle Occupancy Rate	1.2	Ridesharing	1.3
Peak Hour Percentage:			
Inbound Morning	39%	Alternate	35%
Outbound Evening	32%	Work Schedules	30%
Resulting Peak Hour Work Trips:			
Vehicle Trips:			
Morning In	391		297
Evening Out	364		289
Transit Trips:			
Morning In	272		278
Evening Out	260		279

*Trip generation factors for the original analysis estimate are weighted averages for general office, medical office, research, and retail space.

Source: Vanasse Hangen Brustlin, Inc.

7.0 AIR QUALITY

7.0 AIR QUALITY

7.1 INTRODUCTION

As part of the Project Impact Report, an air quality analysis of the project area is required by the Executive Office of Environmental Affairs. The objective of the air quality analysis is to determine if the proposed University Associates project will interfere with the attainment or maintenance of Massachusetts and National Ambient Air Quality Standards (NAAQS). The key source of project-related air pollution is emissions from motor vehicles in the area of the site. Of the various air pollutants emitted, carbon monoxide (CO) is used in this analysis as an indicator of roadway air pollution levels, since it is the most abundant and persistent pollutant emitted by motor vehicles. Also, since CO is a relatively inert substance, its concentration in the air can be easily predicted.

The NAAQS were established by the Federal Clean Air Act, and are designed to protect both public health and welfare. To demonstrate compliance, it is necessary to identify those areas of human activity (sensitive receptors) exposed to maximum air pollutant levels from motor vehicle emissions in the project area. Using air quality modeling techniques, CO levels are estimated at these sensitive receptors for all project alternatives in the present and future years. Comparison of projected pollutant levels to the NAAQS permits evaluation of whether motor vehicle emissions related to the proposed development will pose a threat to public health or welfare.

National Ambient Air Quality Standards (NAAQS) for carbon monoxide have been set by the U.S. Environmental Protection Agency (EPA). Standards for the Commonwealth of Massachusetts are identical to the federal standards. The standards, intended to protect the public health, set a maximum concentration of 35 parts per million (ppm) for a 1-hour period and 9 ppm for an 8-hour period, each not to be exceeded more than once per year. The target date for attainment of national CO standards in Massachusetts was December 31, 1987. The Clean Air Act Amendments approved in October 1990 will introduce a new series of timetables for the states to attain compliance for all criteria pollutants, including CO.

The adverse health effects of carbon monoxide are a result of its combination with blood hemoglobin to form carboxyhemoglobin (COHb). This compound interferes with the life-sustaining transfer of oxygen from the lungs to the body

tissues and the return of carbon dioxide from the tissues to the lungs. The presence of relatively small amounts of CO results in significant interference with essential cardiovascular-respiratory functions. Brief exposure to high levels of CO can impair vision, physical coordination, and the perception of time.

Special attention is given to the daycare center in 7.4 Mitigation Measures, including a discussion of the potential impacts of traffic, construction, and the location within the parking garage. Although no adverse impact is anticipated, mitigation measures are included in the University Associates project which will further reduce the possibility of potential impacts.

7.2 AIR QUALITY MODELING METHODOLOGY

The microscale air quality analysis calculated maximum 1-hour and 8-hour CO concentrations at sensitive receptors near eight roadway intersections for the following cases:

Year	Development Alternative
2000	No-Build
2000	Build

The Massachusetts Environmental Policy Act (MEPA) and Boston Redevelopment Authority (BRA) scopes required a microscale air quality analysis for any intersections in the study area operating at Level-of-Service (LOS) D (where the project adds 10 percent or more to the traffic volumes) and for any intersections operating at LOS E or F.

For this project, it was determined that the LOS for the 2000 Build case would be used to determine which intersections should be analyzed. This is because the completion of the Central Artery/Tunnel (CA/T) project will result in dramatic changes to the volume and distribution of traffic at intersections in the study area, and existing LOS would not be appropriate for determining which intersection should be studied for the Year 2000. Based on LOS data supplied by the traffic engineers, Vanasse Hangen and Brustlin (VHB), the following eight intersections were identified as requiring analysis:

Intersection	
#2	Malden Street/Albany Street
#3	E. Brookline Street/Albany Street

#5	E. Concord Street/Albany Street
#8	Massachusetts Avenue/Harrison Avenue
#9	Massachusetts Avenue/Albany Street
#10	Massachusetts Avenue/Melnea Cass Boulevard/Massachusetts Avenue Connector/Southampton Street
#12	Southampton Street/Frontage Road/Ramps
o	Site Garage/Albany Street

The numbered intersections (following VHB's intersection numbering) listed above were selected according to the LOS criteria. The site garage/Albany Street intersection was added to the analysis to complete the evaluation of all the access roads to both garages. The other two garage access roads are included with intersections #3 and #5. Estimation of CO levels under the two scenarios provides a good indication of whether the construction of the University Associates project will interfere with the attainment of the NAAQS. Since CO levels are highest near intersections where traffic congestion occurs, compliance with the NAAQS at these locations protects public health elsewhere in the community. The technical approach used in all cases to predict ambient air quality levels was discussed in advance with the Massachusetts Department of Environmental Protection (DEP) and the BRA[1]. The details of the technical approach can be found in Appendix G.

7.2.1 DISPERSION MODEL

The mathematical computer model CALINE3[2] was used to predict concentrations of CO at sensitive human receptors near the intersections. Multiple receptors were used at each intersection and were located based on land use considerations, i.e., where the public has access and is expected to be for periods of time. Additional receptors were placed around some intersections in order to increase the number of modeled CO predictions even though public access is not currently anticipated. Receptors were placed at least three meters from the edge of the nearest travel lane so that they were not within the roadway mixing cell, and a receptor height of 1.8 meters was assumed. Scaled maps of land use and receptor locations are shown in

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1 Personal communication, Ms. Christine Kirby, Division of Air Quality Control, Department of Environmental Protection, Boston, MA, and Mr. Richard Mertens, Boston Redevelopment Authority, Boston, MA

2 California Department of Transportation, CALINE-3. A Versatile Dispersion Model for Predicting Air Pollutant Levels Near Highways and Arterial Streets, FHQA/CA/TL-79/23, Sacramento, CA, November 1979.

Exhibits 1 through 8. At the intersections of Albany Street and E. Brookline Street, and Albany Street and E. Concord Street, receptors representing the proposed project were conservatively placed three meters from Albany Street and the garage exits. See Exhibits 7 - 2 and 7 - 3.

The EPA Guideline for Modeling Carbon Monoxide from Roadway Intersections[3] describes the proper use of the CALINE-3 dispersion model in a microscale analysis of free-flow and queuing emissions from motor vehicles at an intersection. EPA has programmed these procedures with the CALINE-3 model in a software package called CAL3QHC[4], which was used for this analysis. Output from the CAL3QHC model can be found in Appendix G.

The EPA recommends the use of the CAL3QHC model to predict concentrations of CO at congested roadway intersections. The CAL3QHC model is a computer program which combines the CALINE-3 model with a traffic model. The traffic model in the CAL3QHC model estimates queue lengths and the contributions of emissions from vehicles at signalized intersections, using EPA guidance. A number of state-of-the-art techniques were used to adapt the CAL3QHC model for specific situations. For unsignalized intersections, equations (6) and (7) in the EPA Indirect Source Guideline Model[5] were used to estimate queue length. In the case of over-capacity, unsignalized intersections, the NCHRP Report 133[6] was employed to estimate queue lengths.

Dispersion modeling with the CALINE3/CAL3QHC models requires a set of conservative meteorological input parameters. These parameters include a worst-case meteorological condition of Pasquill-Gifford Class D stability in conjunction with a 1.0 meters per second (m/s) wind speed, the worst-case wind direction (determined by analyzing all directions at 10 degree increments), a mixing height of 850 meters, a roughness length of 321 cm (for a central business district) and a vehicle spacing of 6 meters.

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3 EPA Region I, Region I Mobile Source Modeling Procedures, Boston, MA, August 13, 1987.

4 Schattanek, G., J, Kahng, and T. Stratou, User's Guide to CAL3QHC – A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections, U.S. EPA Office of Air Quality, Planning and Standards, T. Braverman – Technical Representative, Research Triangle Park, September 1990.

5 EPA, Guidelines for Air Quality Maintanance Planning and Analysis Volume 9 (Revised): Evaluating Indirect Sources, Second Printing, EPA - 450/4-78-001, Research Triangle Park, NC, September

6 National Cooperative Highway Research Program, NCHRP 133, Procedures for Estimating Highway User Costs, Air Pollution, and Noise Effects, 1972.

7.2.2 EMISSION RATES

The mathematical computer model MOBILE4[7] was used to calculate the CO emissions from the vehicle population based on traffic flow characteristics. Roadway CO emission rates used in this study are based on the MOBILE4 default national motor vehicle mix, an average December temperature of 30°F, and the 1985 Massachusetts registration distributions for seven vehicle types. An appropriate vehicle cold/hot start mix was used for determining roadway emissions during the peak 1-hour and 8-hour periods. Emission rates for the peak 1-hour and 8-hour periods are based on speed limits for the vehicles in the study area. These speeds represent the free-flow condition between intersections. Excess emissions due to idling in queues were also calculated by MOBILE4. Emission rates used in this analysis assume a statewide Inspection and Maintenance Program starting in 1983, with a 13-percent stringency factor and no mechanic training for pre-1981 model years, and an idle test with a cut-point at 1.2 percent CO for 1981 and later model years. Details on the information which was used with the MOBILE4 model and the output from the MOBILE4 program can be found in Appendix G.

The MOBILE4 CO emission rates used for this analysis do not take into account the reduction in CO emissions mandated by the recent revisions to the Clean Air Act. These revisions establish more strict tailpipe emission standards for CO and other pollutants, to be phased-in beginning with vehicles produced in the 1994 model year. The EPA will also establish a more strict tailpipe standard for CO under cold temperature conditions, the conditions for which this analysis was done. When these lower CO emissions standards are incorporated into the MOBILE emissions model later this year, they will result in predicted CO emissions for the Year 2000 which are lower than those used for this analysis.

7.2.3 BACKGROUND AIR QUALITY

In urban areas, such as near the site of the proposed University Associates project, a fairly constant and diffuse level of CO due to the numerous sources spread throughout the area is always present in the air . Such sources include all stationary fuel combustion facilities, as well as motor vehicle emissions on roadways. This diffuse level of air pollution is called the background level.

Background air quality can be determined by monitoring and testing air samples. It is necessary to estimate a value for the background CO level in this study since it is added to the impact of local sources (namely, roadway intersections in the study

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7 U.S. EPA, User's Guide to Mobile4 (Mobile Source Emission Factor Model), EPA-AA-TEB-89-01, Ann Arbor, MI February 1989.

area) in determining whether air quality at a particular location complies with the NAAQS. No state monitoring station currently exists near the proposed site. Background levels of CO in the study area have been conservatively estimated by the Massachusetts Department of Environmental Protection (DEP) to be no more than 5.0 ppm for a 1-hour period and 3.0 ppm for an 8-hour average. The 1-hour and 8-hour CO background levels for the Year 2000 were estimated to be the same as existing levels. This is a conservative assumption since urban CO concentrations have been decreasing due to application of vehicle emission controls.

7.2.4 TRAFFIC INFORMATION

The analysis utilized peak 1-hour and 8-hour traffic volumes. Traffic volume data for the intersections represent peak 1-hour conditions and are presented in the traffic section of this PIR. Peak 8-hour traffic volumes in the study area were estimated by applying a factor of 0.85 to the peak 1-hour traffic volumes. This factor was determined from the peak 1-hour and 8-hour average traffic based on the results of three 24-hour weekday automatic traffic counts taken at roadways near the site.

Peak traffic volumes were available for both the morning and afternoon periods. For each intersection, the peak traffic volumes used for the modeling were chosen from the period which had the highest total approach volume and the worst LOS. In most cases this was the morning peak; however, for the intersection of Malden Street and Albany Street and the intersection of Massachusetts Avenue and Melnea Cass Boulevard, the modeling utilized afternoon peak traffic data.

Roadway geometry and control for the intersections is outlined in Appendix G. Roadway geometry is assumed to be the same as what exists today, except for the addition of two garage access roads (one of the three garage access roads is a parking lot access road in the 2000 No-Build case). Traffic signal phasing was provided by Vanasse Hangen and Brustlin and takes into account the coordinated traffic signals proposed by the Boston Transportation Department for Massachusetts Avenue. The analysis utilizes the 2000 Build traffic number, and does not assume any project-specific road improvements are implemented. The analysis does assume the completion of the CA/T project and the modification of the Massachusetts Avenue Connector (see the transportation section of this EIR for more details). The capacity for turning movements at unsignalized intersections was

determined using worksheets from the Highway Capacity Manual-1985[8] (see Appendix F).

7.3 PROBABLE PROJECT IMPACTS

The air quality analysis predicted maximum 1-hour and 8-hour CO concentrations at sensitive receptors in the study area. The cumulative results of the air quality analysis, including impacts from intersection traffic and background carbon monoxide, are presented in Tables 7 - 1 and 7 - 2, respectively. These results do not characterize typical air pollution levels in the project area. Rather, they represent the highest concentrations that could exist during the joint occurrence of worst-case meteorology and peak traffic.

2000 No-Build

Maximum 1-hour CO concentrations for the 2000 No-Build case are projected to be in the range of 6.5 to 14.7 ppm, and 8-hour levels are expected to range between 3.6 and 8.1 ppm. The maximum concentrations are predicted to occur at the intersection of Massachusetts Avenue and Melnea Cass Boulevard, for both time periods. All receptors are predicted to be in compliance with the NAAQS for the 1-hour and the 8-hour periods.

2000 Build

Construction of the University Associates project will increase CO levels slightly in the Year 2000. For the 2000 Build case, maximum 1-hour CO concentrations are projected to be between 7.0 and 14.9 ppm, and 8-hour levels are projected to range between 3.9 and 8.2 ppm. Again, the maximum levels are predicted to occur at the intersection of Massachusetts Avenue and Melnea Cass Boulevard. All receptors are predicted to be safely in compliance with the NAAQS for the 1-hour and 8-hour periods. Therefore, the University Associates Project will not interfere with the attainment and maintenance of the NAAQS for CO in the project area.

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8 National Cooperative Highway Research Program, NCHRP 133, Procedures for Estimating Highway User Costs, Air Pollution, and Noise Effects, 1972.[8] Transportation Research Board, Highway Capacity Manual -- Special Report 209, Washington, D.C., 1985.

Table 7 - 1
MAXIMUM PREDICTED 1-HOUR CARBON MONOXIDE CONCENTRATIONS AT SENSITIVE RECEPTORS PLUS BACKGROUND

	Intersection	2000 No-Build	2000 Build
#2	Malden Street/Albany Street	9.8	9.9
#3	E. Brookline Street/Albany Street	7.2	8.2
#5	E. Concord Street/Albany Street	6.5	7.4
#8	Massachusetts Avenue/Harrison Avenue	10.6	10.7
#9	Massachusetts Avenue/Albany Street	11.4	11.7
#10	Massachusetts Avenue/Melnea Cass Blvd./ Massachusetts Avenue Connector	14.7	14.9
#12	Southampton Street/Frontage Road/Ramps	11.2	11.2
	Site Garage Access/Albany Street	-	7.0
	1-hour NAAQS limit	35.0	35.0

Source: Tech Environmental, Inc.

Table 7 - 2
MAXIMUM PREDICTED 8-HOUR CARBON MONOXIDE CONCENTRATIONS AT SENSITIVE RECEPTORS PLUS BACKGROUND

	Intersection	2000 No-Build	2000 Build
#2	Malden Street/Albany Street	5.9	6.0
#3	E. Brookline Street/Albany Street	4.1	4.2
#5	E. Concord Street/Albany Street	3.6	4.1
#8	Massachusetts Avenue/Harrison Avenue	6.0	6.1
#9	Massachusetts Avenue/Albany Street	6.4	6.5
#10	Massachusetts Avenue/Melnea Cass Blvd./ Massachusetts Avenue Connector	8.1	8.2
#12	Southampton Street/Frontage Road/Ramps	5.4	5.5
	Site Garage Access/Albany Street	-	3.9
	8-hour NAAQS	9.0	9.0

Source: Tech Environmental, Inc.

7.4 MITIGATION MEASURES

This air quality analysis does not assume the implementation of any traffic or roadway mitigation improvements. If roadway improvements are implemented at any intersections it is likely that the maximum predicted air quality impacts at those intersections would be even less than those presented here.

To minimize and reduce the potential air quality impacts of the University Associates project, an extensive transportation mitigation plan has been developed and discussed in detail in Section 6.0, Transportation. The proponent is committed to mitigating transportation-related impacts on the project area through the following measures:

- Roadway and traffic control improvements
- Travel demand management
- Public transportation promotion
- Parking management
- Pedestrian improvements
- Construction traffic management
- General access goals and monitoring

Once the access plan goals and transportation mitigation program are implemented, it is estimated that evening peak hour vehicle trips will decrease by approximately 20%. With transit incentives in place, the trip generation by automobile is expected to drop from 60% to 55%, while ridesharing will increase the vehicle occupancy rate from 1.2 to 1.3 persons per vehicle.

7.4.1 DAYCARE CENTER

The location of the daycare facility in, or adjacent to, the proposed garage (Building 1) does not expose the facility to air quality levels different from other urban locations. As discussed below, the strict standards used, proper circulation design, and the open-air venting system of the garage avoid any potential for unusual or unsafe accumulation of carbon monoxide.

The proposed facility is located away from Albany Street. It is adjacent to two potential sources of air pollution -- Massachusetts Avenue Connector/East Concord Street and the parking garage. The U.S. EPA Guideline for Modeling Carbon Monoxide from Roadway Intersections states that dispersion modeling for possible adverse impacts on air quality is necessary only when the LOS is C or worse. It should be noted that EPA established these standards to protect the most sensitive sub-groups of the population, such as children, with an adequate margin of safety.

The intersections are projected to operate at LOS A or B in peak hours (See Section 6.0, Transportation) which indicates a low level of congestion.

The parking garage is an open air structure which depends on natural ventilation. In air quality studies of other parking garages it has been found that the potential for violating carbon monoxide health standards near a parking structure only occurs when it has an inadequate forced-air ventilating system or when the structure is poorly designed, so as to cause excessive queuing of exiting cars. Neither of these conditions apply to the proposed facility.

The University Associates garage building is designed to ensure minimal delays for exiting vehicles. It does not propose a closed ventilation system, but an open air system which disperses emissions through numerous wall openings at each level.

Construction, subsequent to the opening of the daycare center, may cause temporary airborne dust through excavation and demolition activities. The excavation activity will be principally for utilities, pile caps, and grade beams. Excavation for subsurface parking is contemplated for buildings at the opposite end of the site. The site is currently covered with asphalt paving so the fugitive dust generated will be minimal. Staging areas and construction roads will be paved. Travel through the site will be limited. Exposed areas will be wetted down to reduce airborne particulates. Dust also will be controlled by covering and locating excavated soil and debris stockpiles away from the daycare center. There will be periodic street cleaning and cleaning of areas near the daycare center and pedestrian areas. These and any other construction activities will be identified and mitigated in the Traffic Maintenance Plan required by the city.

Demolition involved with the new Massachusetts Avenue Connector is handled through the CA/T project. Construction mitigation, as stated in the Draft Supplemental Environmental Impact Report and Supplemental Final Environmental Impact Statement, will be implemented to reduce impact on sensitive receptors such as the daycare center. Measures include the use of tarpaulins on stockpiled debris, watering disturbed areas, and covering trucks transporting debris. Special provisions for handling and transporting materials containing lead in conjunction with bridge and viaduct demolition also are included. Construction mitigation also is discussed in Section 12.0, Construction. Following construction of each phase, permanent landscaping and paving of the entire site will be completed and maintained. These measures will ensure compliance with 310 CMR 7.09 to prevent fugitive dust impacts.

The BUMC currently operates incineration facilities on its campus. The University Associates project involves replacing these facilities with new facilities which will

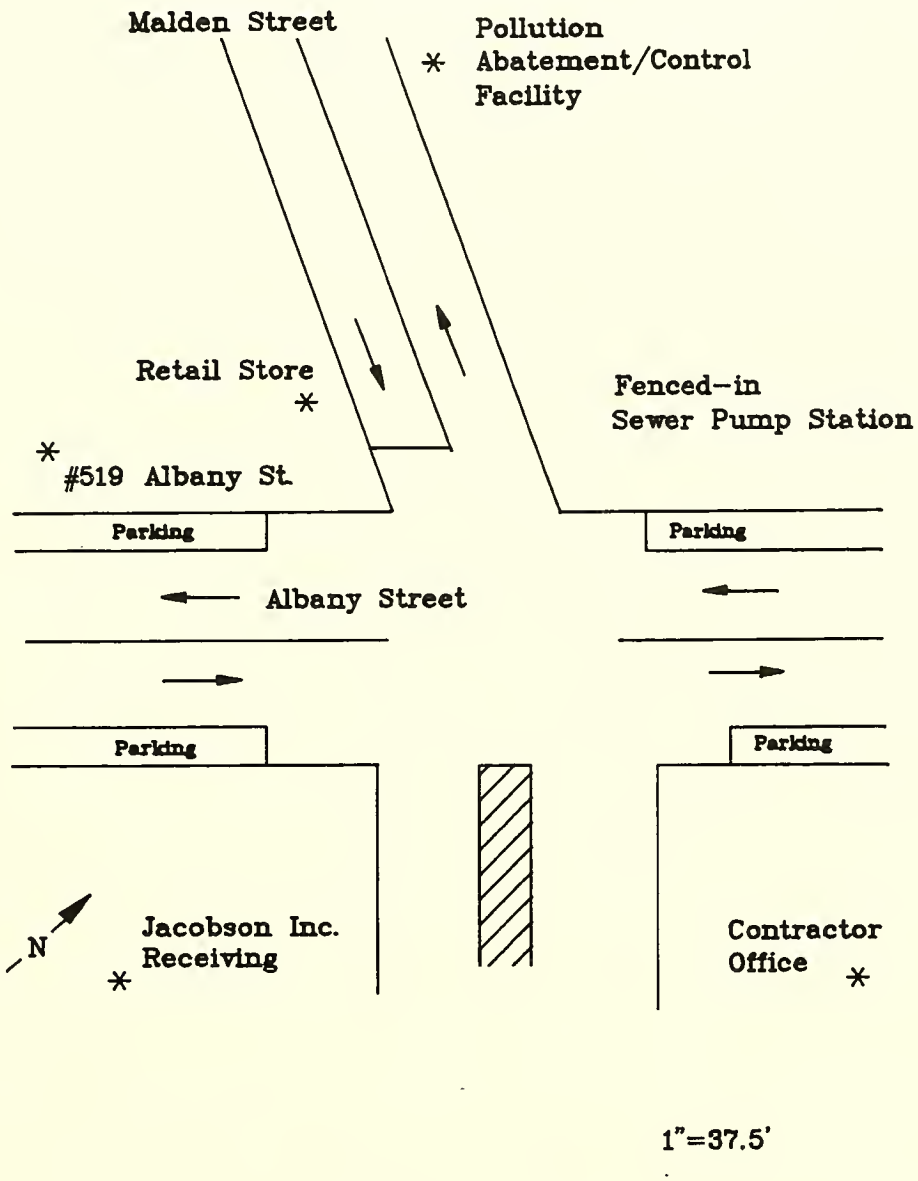
only serve the BUMC campus. Pursuant to 310 CMR 7.02 the facility will require an Air Plans Approval from DEP, which includes Best Available Control Technology and emissions control devices for the incinerator. Part of the DEP permit approval involves making detailed estimates of air pollution emissions, performing dispersion modeling, and demonstrating compliance with all NAAQS, AAI and TEL limits.

7.5 SUMMARY

A microscale carbon monoxide (CO) analysis has been carried out within the study area for the proposed University Associates project in Boston, Massachusetts. Ambient air quality was calculated at eight intersections in the vicinity of the proposed project site under two scenarios: 2000 No-Build, and 2000 Build. Traffic volumes and vehicle speeds for peak conditions, combined with worst case meteorology, were used to predict maximum 1-hour and 8-hour CO concentrations. No project-specific roadway and traffic control improvements were assumed for the air quality modeling.

According to the modeling results, 1-hour and 8-hour CO concentrations for all receptors in each scenario are below the National Ambient Air Quality Standard (NAAQS) of 35 ppm and 9 ppm, respectively. Maximum 1-hour and 8-hour CO concentrations under the 2000 Build scenario are predicted to be 14.9 ppm and 8.2 ppm, respectively. The maximum predicted CO concentrations are predicted to occur at the intersection of Massachusetts Avenue and Melnea Cass Boulevard. A comparison of the 2000 Build and No-Build model results shows that the proposed project has a very small impact on air quality. Even without any roadway improvements, the University Associates project does not interfere with the attainment and maintenance of the NAAQS for CO in the project area.

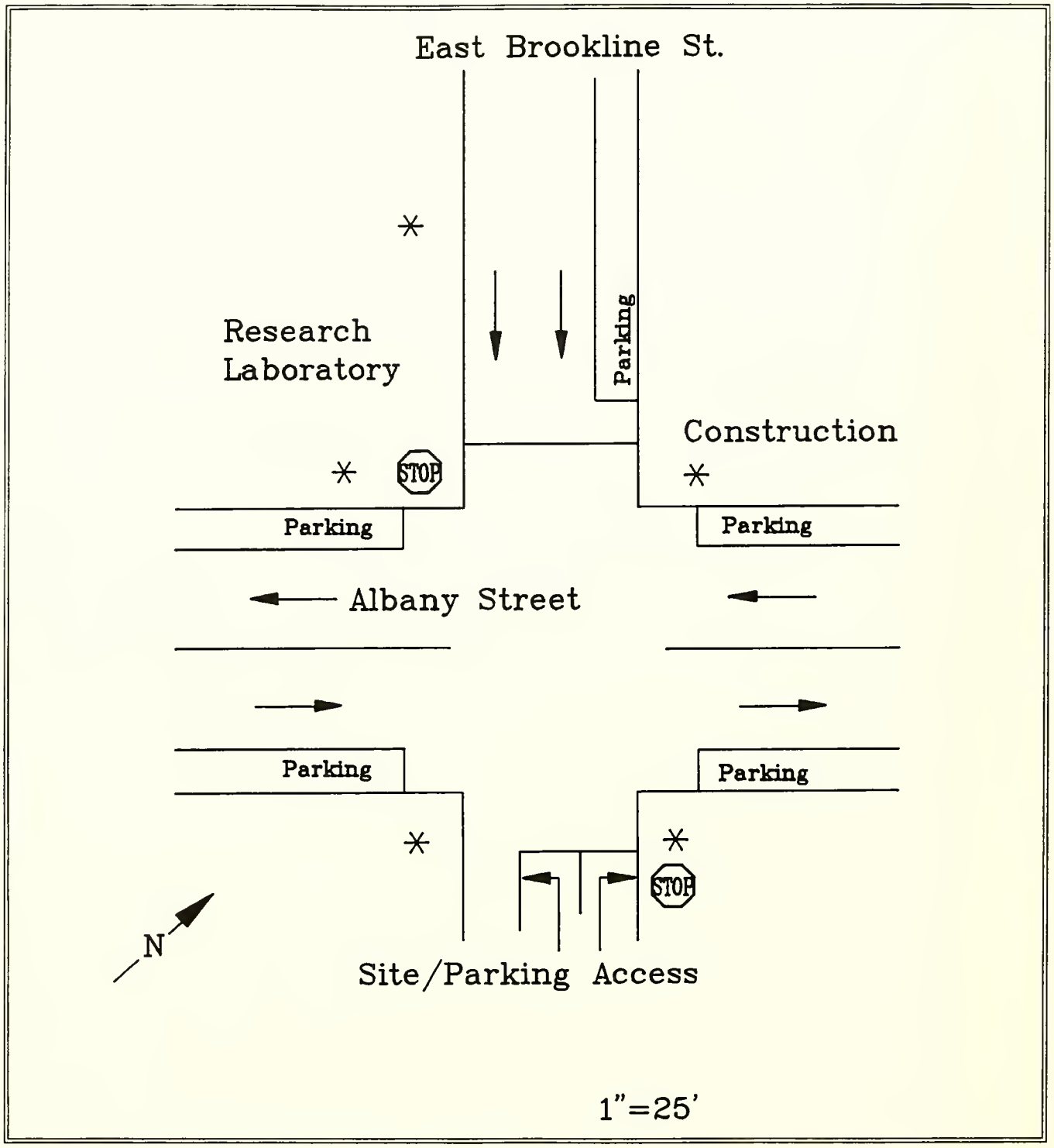
Additional analysis of potential air quality impacts on the daycare center were conducted regarding its location in the parking garage, proximity to major streets, and proximity to subsequent construction activities. These analyses reveal no adverse impact on the daycare center and play area. However, mitigation measures addressing these concerns are included in the University Associates project to further reduce the potential for air quality impacts.



Malden Street and Albany Street

Prepared By:
Tech Environmental, Inc.

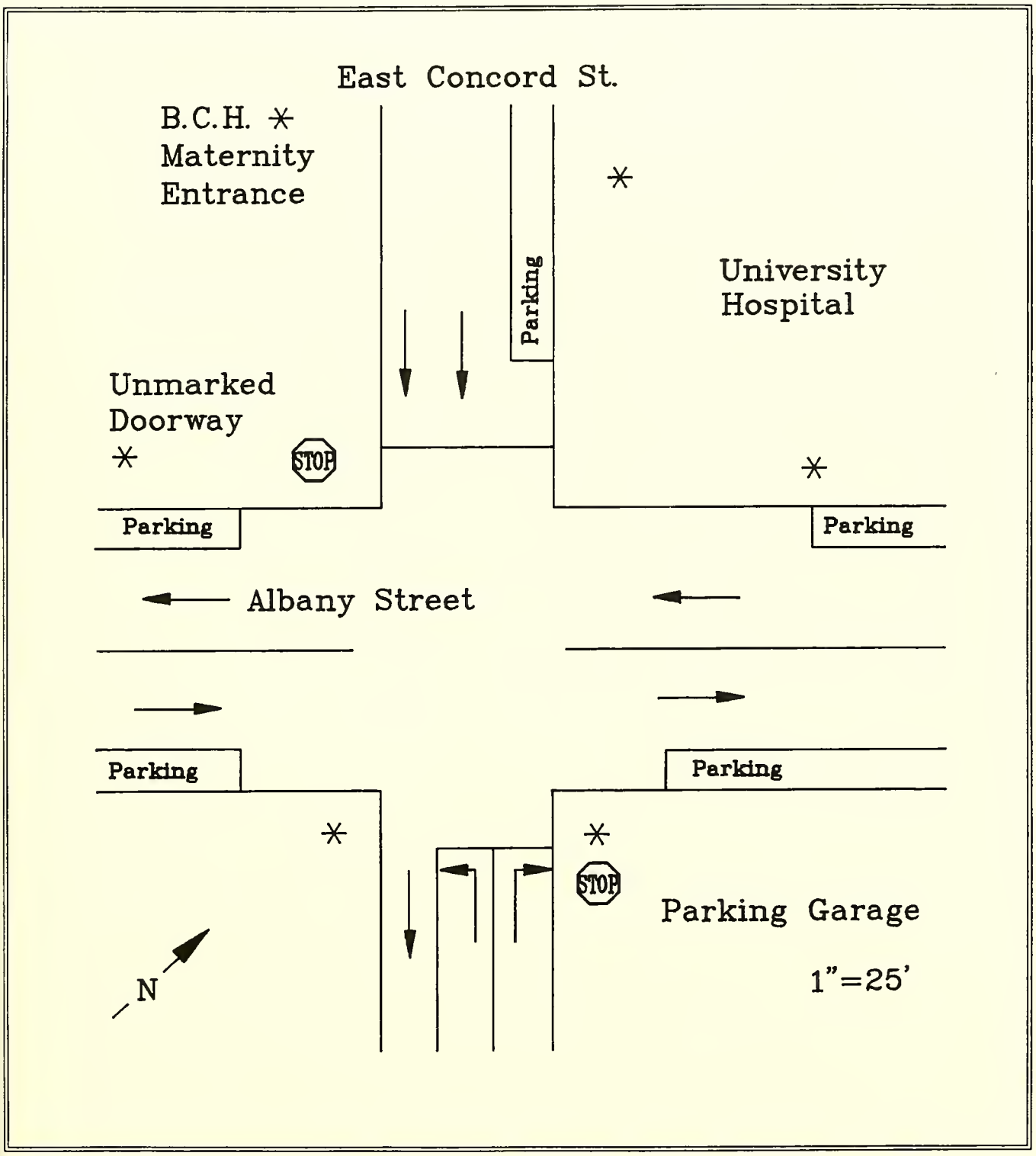
Exhibit 7 - 1



E. Brookline Street and Albany Street

Prepared By:
Tech Environmental, Inc.

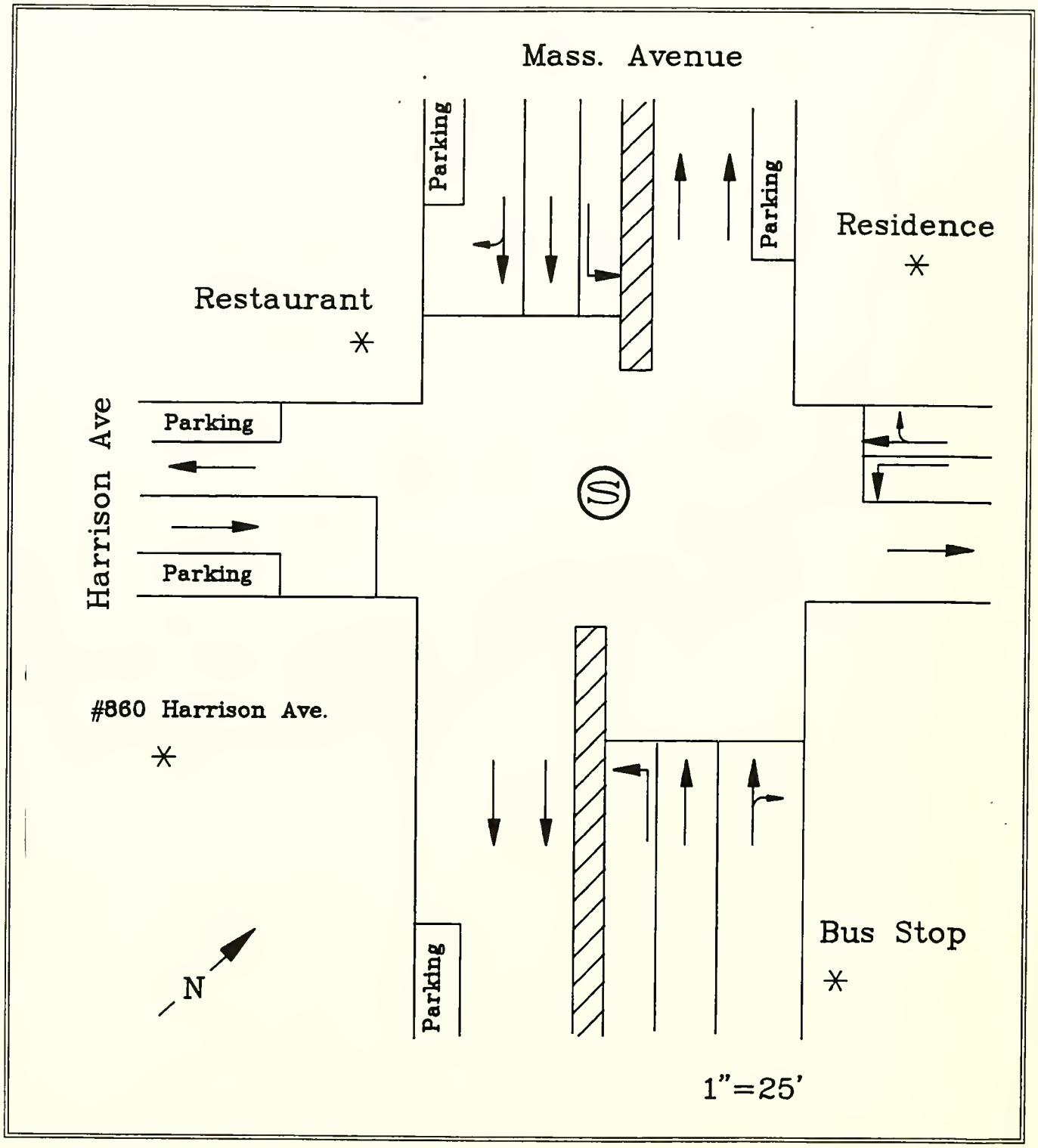
Exhibit 7 - 2



E. Concord Street and Albany Street

Prepared By:
Tech Environmental, Inc.

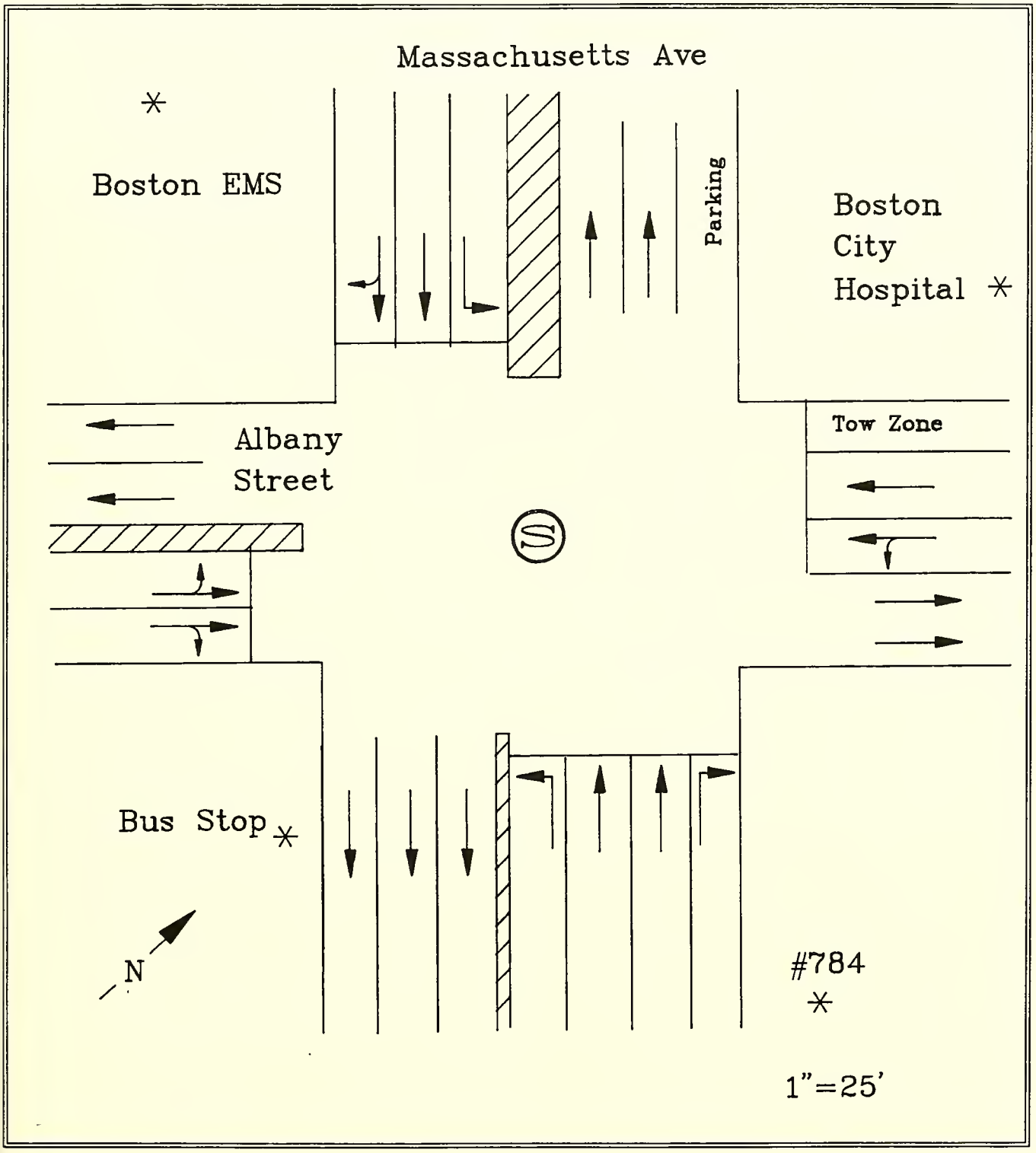
Exhibit 7 - 3



Harrison Avenue and Massachusetts Avenue

Prepared By:
Tech Environmental, Inc.

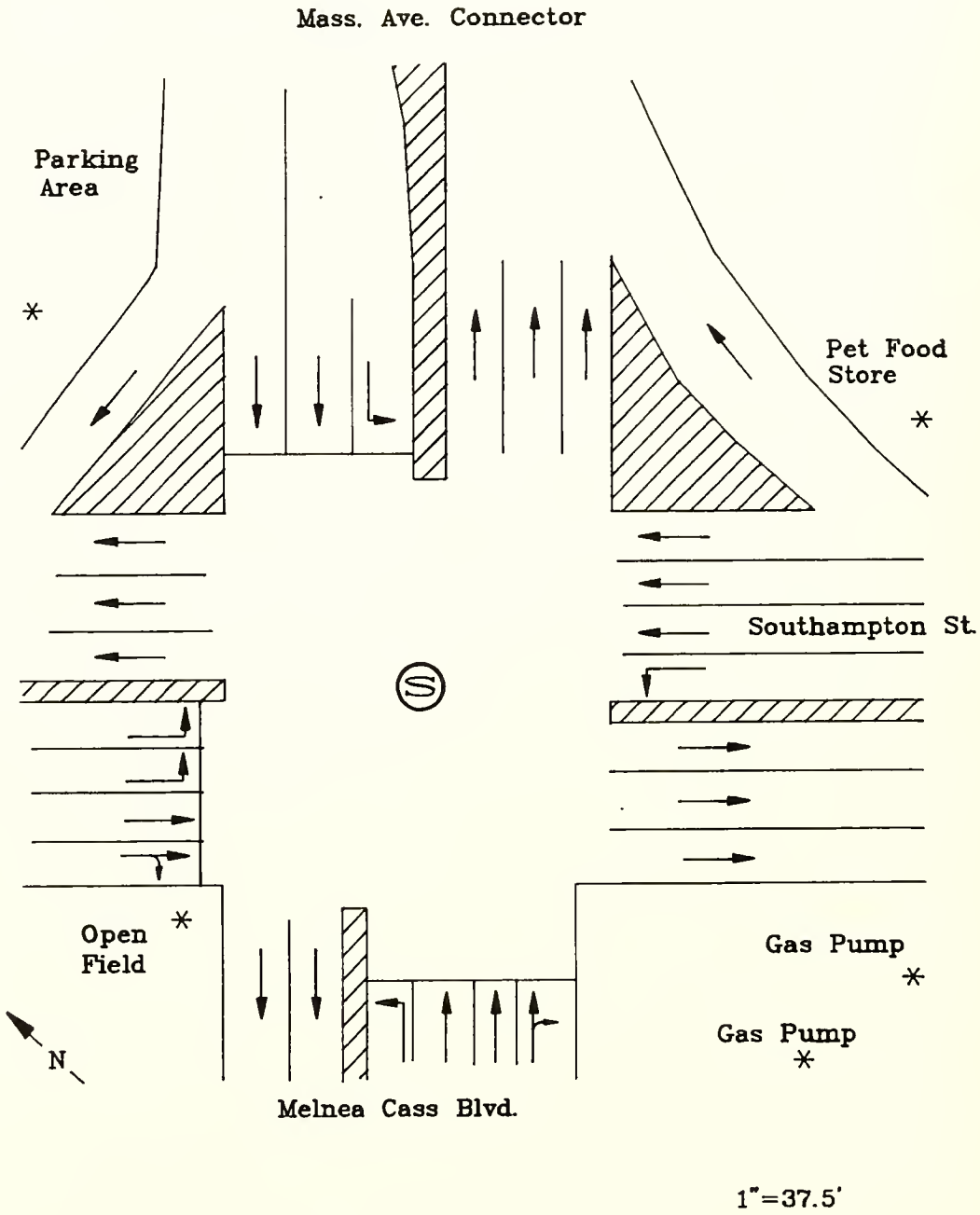
Exhibit 7 - 4



Albany Street and Massachusetts Avenue

Prepared By:
Tech Environmental, Inc.

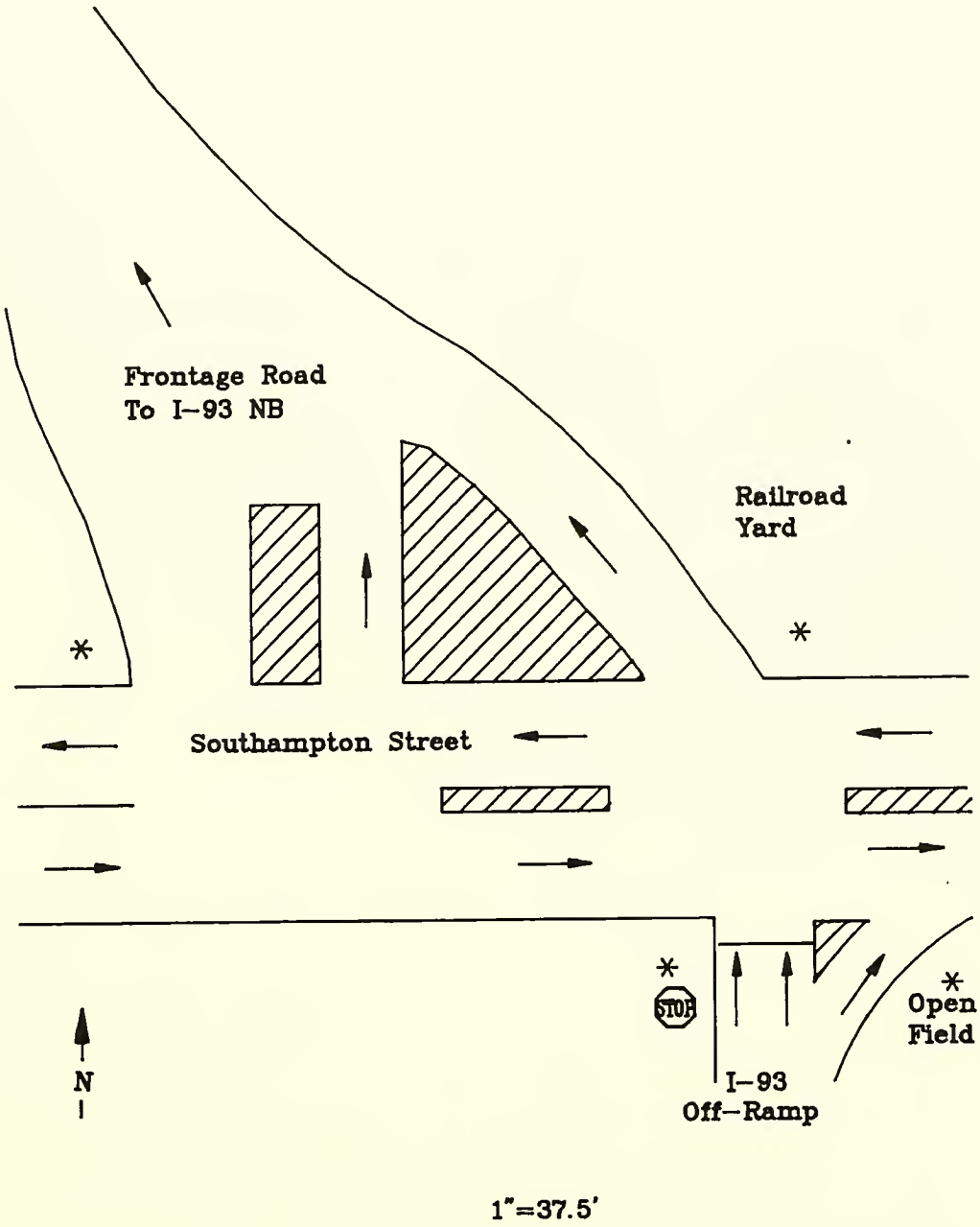
Exhibit 7 - 5



Massachusetts Avenue and Melnea Cass Boulevard

Prepared By:
Tech Environmental, Inc.

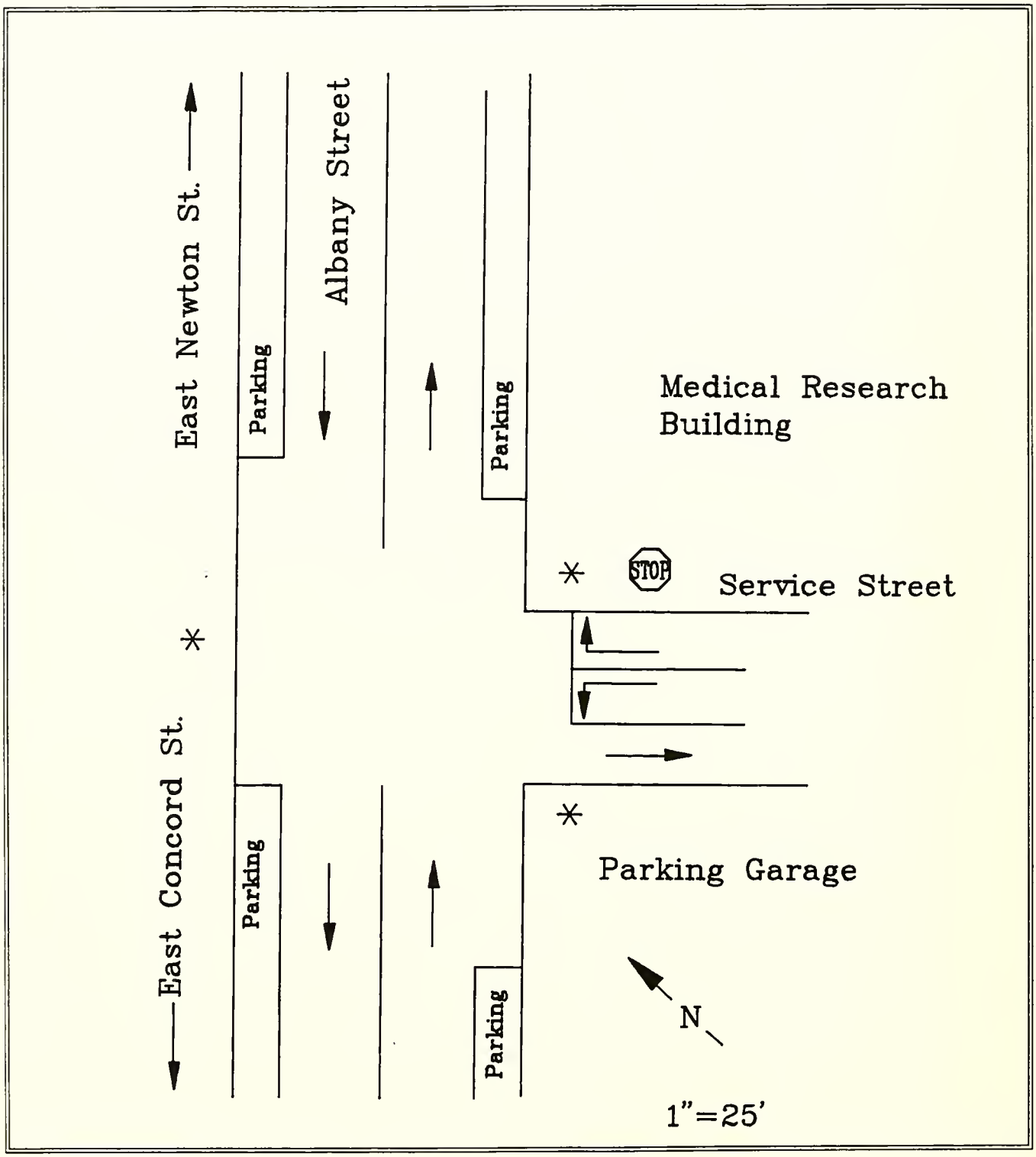
Exhibit 7 - 6



Southampton Street and Frontage Road/I-93 Ramps

Prepared By:
Tech Environmental, Inc.

Exhibit 7 - 7



Garage Access Road and Albany Street

Prepared By:
Tech Environmental, Inc.

Exhibit 7 - 8

8.0 NOISE

8.0 NOISE

8.1 INTRODUCTION

The University Associates project site is located in an urban setting close to the Southeast Expressway between Albany Street and the Massachusetts Avenue Connector. The existing sensitive receptors include the medical facilities and residential neighborhood located some distance from the site across Albany Street. Once the project is built, the daycare facility proposed for the first floor of Building 1 also will be the closest sensitive receptor.

Noise is generated by several sources: temporary construction activities related to the University Associates project and the CA/T project; traffic on and near the site; and the external mechanical systems of the new buildings on site. Noise generated by all of these activities is not expected to be unusual for an urban site or disruptive to the sensitive receptors. Mitigation measures will be implemented during and after construction to assure noise levels are kept to acceptable levels as defined in the Regulations for the Control of Noise in the City of Boston (noise regulations). Similarly, mitigation measures are included in the project design to control noise from traffic and exterior mechanical systems.

8.2 CONSTRUCTION

Although no blasting is necessary for construction of the University Associates project, pile driving and typical excavation and erection activities associated with mid- and high-rise buildings will occur. The construction hours for the project are from 7:00AM to 4:00PM. Noise and vibration associated with construction of the project will be controlled through a variety of measures designed to minimize the impacts to sensitive receptors such as the daycare center, nearby medical facilities and pedestrian areas. Below is a list of measures which will be implemented to mitigate construction noise and vibration. These conditions will also be stated in the required Transportation Management Plan. Some conditions are also incorporated in the Cooperative Agreement between the BRA and the proponent.

- No construction activities will occur before 9:00AM on Saturdays.
- Construction vehicles will not be allowed to use East Concord, East Newton, and East Brookline Streets.

- Pile cavities and utilities which are located near sensitive receptors such as the daycare center will be pre-augered to minimize noise and vibration impacts.

- No pile driving will occur before 8:00AM on weekdays or 9:00AM on Saturdays.

- Pile driving noise and vibration will be monitored to enforce compliance with construction specifications which incorporate applicable noise regulations.

- Solid fencing with a minimum height of 8 feet will be erected near the daycare center to serve as a sound barrier and control dust.

- Noisy equipment will be located away from sensitive receptors and areas of pedestrian activities as much as is practical.

- Vehicle noise control equipment such as mufflers will be inspected to assure good working condition.

- Use of relatively quiet models of equipment will be encouraged.

The CA/T project also will implement a similar noise and vibration control program as set forth in the Supplemental Draft and Final Environmental Impact Statement/Report. This is discussed further in Section 12.0, Construction.

8.3 TRAFFIC

The City noise regulations[1] state that the maximum allowable noise level for a business zoned district is 65 dBA and the maximum level for a residential zone in the daytime is 60 dBA. The daycare center, located in a business zone district, will be the sensitive receptor closest to the project and the one most likely to be affected by traffic noise generated by the project. The outdoor play area is located adjacent to the new Massachusetts Avenue Connector and East Concord Street extension. Based on traffic projections for the 2000 Build peak hour, the maximum noise level created by the new Massachusetts Avenue Connector at the closest edge of the outdoor play area of the daycare center is predicted to be 70 dBA. This estimate was made using the Federal Highway Administration (FWHA) Highway Traffic

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1 Although the city's regulations do not govern traffic noise, they are used here as a measure of the quality of the noise environment at the site.

Noise Prediction Model. These levels reflect typical noise during rush hour in an urban area.

The daycare outdoor play area design includes a high density solid wood or concrete wall around the perimeter. This wall will be 8-12 feet above the base of the Connector roadway and will be designed to achieve a minimum attenuation of 10 dBA (removal of 90% or more of the sound energy) at the outdoor play area. Thus, the resulting noise levels inside the wall during the day will not exceed 60 dBA, which is the acceptable daytime residential noise standard set forth in the city noise regulations.

The interior space of the daycare center will be protected from traffic and other noise by both the exterior wall and building walls which will attenuate an additional 17 to 27 dBA, depending on whether the windows are open or closed.

The operation of the garage is not expected to produce objectionable noise inside the daycare center. The noise levels generated by traffic within the garage will be relatively low due to low vehicle speeds. Other sources of sound associated with garage traffic would be occasional door closing and horn noise. The interior walls separating the daycare center from the garage will be well insulated to provide a minimum attenuation of 30 dBA from garage sources.

8.4 EXTERIOR MECHANICAL SYSTEMS

The University Associates buildings and equipment are designed to achieve the minimum noise standards set forth in the city noise regulations. Most of the mechanical systems are located within the building envelope. Transformer vaults located on the ground floor will have louvers to the outside. The external systems are designed not to exceed a noise level of 55 dBA at pedestrian level which is quieter than the allowable 60 dBA residential zone daytime noise level.

External mechanical systems will be located on top of the buildings in mechanical penthouses. The systems which may generate noise include emergency generators, cooling towers, air handlers, exhaust fans and, in some cases, incineration facilities.

The mechanical penthouses are located between 100 feet and 144 feet above the ground varying with the building heights. The height off the ground automatically reduces the noise levels which reach the ground. Each penthouse will be confined within the same exterior brick and stone materials used for the cladding of the buildings. The enclosures will also serve to further reduce noise levels at ground level.

Air handling units which exceed 55 dBA at ground level will be fitted with high-pressure-drop silencers at the intake side of the fans. This measure will effectively reduce noise to acceptable or lower levels.

Exhaust fans are expected to generate noise levels of 47 dBA at ground level, therefore, no further sound attenuation is planned. Similarly, cooling towers and incineration facilities are not expected to exceed standards.

Since emergency generators are not used on any regular or predictable basis, it is not possible to determine if they will create noise problems. Short duration testing will be conducted only at times when the least impact on sensitive receptors and neighbors will occur.

9.0 INFRASTRUCTURE

9.0 INFRASTRUCTURE

9.1 INTRODUCTION

The following section discusses the existing infrastructure in the area which serves the site and the projected utility demands by the University Associates project. Every effort will be made to avoid adverse impacts on the existing utilities during construction including pre-augering pile cavities near utilities. The proponent will implement construction methods and phasing which will minimize any interruptions in service to the hospitals and medical services in the area.

All water and sewer connections will be constructed in conformance with the Boston Water and Sewer Commission's Sewer Use and Water Distribution Facility regulations. The proponent will employ best practical conservation methods in the HVAC systems, land irrigation, plumbing fixtures, and other systems which use water and power. A breakout of infrastructure demand by use for each building is shown in Table 9 - 1. All calculations for utility demands are found in Appendix H, Infrastructure. Since the DPIR, additional meetings have been held with the Boston Water and Sewer Commission (BWSC) on new water, sanitary sewer, and storm drainage service, as well as the removal of old facilities. The discussions also involved coordination of the technical review process. Meeting minutes can be found in Appendix H, Infrastructure.

9.2 WATER SYSTEM

The South End area of Boston receives its domestic and fire protection water from an existing system of water mains which are owned by the BWSC, and which are supplied by the Massachusetts Water Resources Authority's (MWRA) main water transmission system.

There are 12" low service and 12" high service water mains running the full length of the site along Albany Street. Both the 12" low service main, installed in 1990, and the high service main, installed in 1974, are made of ductile iron.

Subsequent to the submittal of the DPIR, which indicates the flows and pressures in the vicinity of the site, the BWSC conducted a recent flow test at 750 Albany Street . The results are shown on Table 9 - 1.

TABLE 9-1
HYDRANT FLOW DATA

	High Service	Low Service
Static Pressure	114 PSI	64 PSI
Residual Pressure	87 PSI	56 PSI
Flow Rate	1,553 GPM	3,399 GPM
Available Flow (@ 20 PSI)	3,045 GPM	8,533 GPM

Flow test conducted on hydrants located at 750 Albany Street, May 8, 1991

Source: Cosentini Associates

The above hydrant flow data generally indicate that a fire pump and domestic water pumping system is required for all buildings in the project. It should be noted that, based on the condition of the pipes, pressure may be different in different pipes. For example, the low service pipes in the area have been installed within the last couple of years, whereas the high service pipe was laid over 15 years ago. This may account for variations in pressures between pipes and in different segments of the same pipe. As pipe ages, its diameter tends to narrow as sediments in the water accumulate in the pipe. Also, as piping ages, leaks can develop, particularly at joints. These conditions can affect pressure readings.

The project domestic water service will be provided by the 12" low service water main along Albany Street. The fire hydrants located throughout the site will be connected to the 12" high service water main in Albany Street.

The low and high service water mains will be extended into the site from Albany Street at the extension of East Brookline Street and in the drive between Buildings 1 and 2. The low and high service mains will follow the service drive around the site back to Albany Street. This piping arrangement provides a loop around the site which allows service to the site from two directions in the event of a break in the water mains in Albany Street. The BWSC has indicated that the existing system is adequate to serve the proposed project.

The total anticipated water demand for this project is estimated as follows:

Domestic Water	157,620 GPD	
AC System	140,110 GPD	
Fire Service	1,500 GPM	(Based on anticipated fire needs.)

See Exhibit 9-1 for the Water System Site Plan.

9.3 WATER CONSERVATION

It is desirable for building systems to be as efficient as possible to minimize water usage. The University Associates project seeks to achieve this goal. It should be noted that much of the project is expected to involve medical research activities which have special operating requirements for ventilation, waste handling, and water supply and quality. These research activities also generate special system needs which may have higher water requirements than conventional office or retail activities.

These buildings are designed in accordance with codes and standards which specifically address these activities including: National Fire Protection Association; the National Institutes of Health; Building Officials and Code Administrators guidelines; and standards set by the American Society of Heating and Refrigeration Engineers.

9.3.1 PLUMBING AND FIRE

All plumbing fixtures installed in this project are water conserving. Wall hung or floor mounted water closets will operate on a maximum of 1.6 gallons per flush; lavatories and sinks will be provided with 0.5 gallon per minute flow controls; urinals will operate at 2.75 gpm. Venturi flow meters, which will reduce wasted water during monthly testing, will be provided on all fire pumps.

9.3.2 HVAC

It should be noted that water and power requirements for Biomedical Research Building (Building 2) are more demanding than other uses on the site due to the special equipment, safety and operations systems. Compared to other buildings, where recirculation of air is allowed, medical research labs require 100% air replacement and have other special requirements for handling and storage of materials. As a conservation measure, variable flow hoods, which adjust to the specific needs at any given time, will be installed at each module.

The heating, ventilation and air conditioning system for the research building will not be utilizing any other water equipment other than the cooling towers. However, water cooled equipment will be utilized in some laboratories. The laboratory equipment has not yet been selected.

Air cooled and roof top unit configurations were investigated and evaluated for this project. Due to the building use, large cooling loads are necessary and space constraints do not allow these options. Furthermore, these alternative cooling units would require more electricity than the water cooled system selected.

The building heat will be provided by 150 psig steam probably from Boston Thermal Energy Corporation. The steam will be reduced to 25 psig in the penthouse using direct high efficiency IDT type steam coils which will provide the bulk of the building heating requirements. A small percentage of the steam will be used for the research building's hot water loop. This heating medium will be achieved through high efficiency steam condensers.

Boston Thermal Energy Corporation has indicated it does not take return steam condensation at it's facility, thus, the building will be required to cool and discharge the condensate. As a conservation measure, the condensate will be used to provide make-up water to the cooling towers when required. The cooling tower represents a total load of 2000 tons with the following water and sewer requirements:

Condenser water supply flow rate	6,000 GPM
Peak make up water required per day	59,000 GPD
Peak cooling tower evaporation	49,500 GPD
Peak cooling tower blowdown	13,500 GPD

During the summer, steam usage will be primarily for generating hot water and laboratory usage. The steam condensate generated will amount to an average of approximately 11,000 gpd. This water will be used entirely for cooling tower make-up water.

During the winter, the building will require an average of 150 tons of cooling for laboratory equipment, computers, and refrigerators. These uses will require approximately 8,000 gpd of make-up water. On the average, approximately 20,000 gpd of steam condensate will be generated by the heating system. Of this, an estimated 12,000 gpd will be discharged into the sewer system.

9.3.3 LANDSCAPING

Wall hydrants which can be used for landscaping, will be placed on the periphery of the buildings. An irrigation system for the site is currently under consideration. The wall hydrants can be modified to accommodate irrigation systems in the future if this becomes desirable. Mulch will be used in all planting beds to reduce evaporation. Indigenous plant species which do not require special watering will be selected for the site.

9.4 SANITARY SEWER

Sanitary sewage in this area is currently carried by the Albany Street Interceptor. This is an existing combined 66" X 68" brick sewer in Albany Street carrying both sewage and storm runoff. The interceptor runs southwesterly to Massachusetts Avenue where it ties into a 108" diameter sewer which, in turn, runs into the Columbus Park Headworks via the East Side Interceptor. These headworks pass the flow to the Boston Main Drainage Tunnel for treatment at the Deer Island plant.

Work to rehabilitate this combined sewer is currently underway. The rehabilitation consists of relining the existing sewer, converting it to a sanitary sewer exclusively and reversing its direction toward the east to the Union Park Pump Station. From the pump station, the flow will be directed to Columbus Park via the East Side Interceptor and on to Deer Island. Since the sewer improvement project is currently under construction, sewer hydraulic tests have been deferred until the project is complete and accurate results can be obtained.

The New Albany Street Interceptor is designed to handle a theoretical flow of 16 million gpd. The University Associates project is estimated to add approximately 121,000 gpd (0.121 mgpd) to the sanitary sewer system. This would comprise approximately 0.75% of the 16 million gpd capacity, thus, there is sufficient capacity to accommodate project flows. At the time the New Albany Street Interceptor was designed, larger buildings with higher demands were anticipated for the University Associates project. Sewer capacity and demand from the proposed project was discussed with staff at the Boston Water and Sewer Commission. The BWSC indicated that the new interceptor was designed to serve the area with the University Associates project included. The assumptions at that time for the project reflected a higher discharge than the project as it is now proposed.

The project will be connected to the existing sewer pipe in Albany Street by four laterals which will extend onto the site from Albany Street. See Exhibit 9 - 2 for Sanitary Sewer Plan. The Biomedical Research Building will be designed to have

an automatic system to adjust the pH to acceptable levels before discharging into the sewer system. All facilities will conform to Article IV of the BWSC Commissioner's Sewer Use Regulations.

9.5 STORM DRAINAGE

The project site is currently used as a parking facility and is composed largely of bituminous concrete paving with a small amount of gravel. Pre and post development will involve paved areas, although post development will include substantial landscaping. Therefore, post development runoff will be the same, or reduced from existing conditions. It is estimated that at least 90% of the surface drainage is currently directed into the Roxbury Canal Conduit, a 216" X 120" concrete structure located along the southern edge of the site. The canal generally flows in an easterly direction to the Fort Point Channel, a tributary of Boston Harbor.

The remaining 10% of the drainage is directed into a combined sewer in Albany Street. The Albany Street drain is a concrete 30" X 52" main along the site which ties into the 72" X 72" main at East Dedham Street, and connects to the Roxbury Canal Conduit.

Approximately 90% of the storm drainage from the project, as it is currently planned, will tie directly into the Roxbury Canal conduit. The runoff generated from the site probably will be reduced from existing levels as there will be a reduction in impervious surfaces. The runoff will be directed to the Roxbury Canal Conduit using existing drain structures as much as possible to minimize impact to the existing system. Storm drainage from the project is estimated to be 30.66 cfs.

Based on discussions with the BWSC, it appears that future projects such as the Central Artery/Tunnel and the Massachusetts Water Resources Authority Combined Sewer Overflow Treatment plant will not adversely impact the storm drainage system in the project area. See Exhibit 9 - 2 for the Storm Drainage Plan.

9.6 STEAM SERVICE

The project site may be provided with high pressure steam service from Boston Thermal Energy Corporation. Presently, a 16" high pressure steam main runs down East Newton Street to Albany Street. The steam line in Albany Street is a 12" line which can be used to bring steam to the site from Boston Thermal Energy Corporation. At the southern end of the site is a 12" main which has been

abandoned by Boston City Hospital according to sources at Boston City Hospital and Boston Thermal Energy Corporation.

The anticipated steam demand from the project is approximately 58,000 lbs/hr. See Exhibit 9 - 3 for the Steam Site Plan.

9.7 GAS DISTRIBUTION

The project will be provided with natural gas by Boston Gas Company. There is currently a 30" intermediate pressure main which runs the full length of the site in Albany Street. The anticipated gas requirement for the project is approximately 18,650 cfh. See Exhibit 9 - 3 for the Natural Gas Site Plan.

9.8 ELECTRIC SERVICE

Electric service for the project will be provided by the Boston Edison Company. An existing 13.8 kV distribution system in Albany Street will be extended to the site to serve the University Associates development.

Each building will be provided with secondary service from Boston Edison at 480/277 volts from a secondary spot network located within the building. Each spot network includes multiple transformers, each fed from a different 13.8 kV circuit to provide redundancy in case of primary feeder or transformer failure. See Exhibit 9 - 4 for Electric Site Plan.

9.9 TELEPHONE AND DATA SERVICE

The New England Telephone Company will provide telephone and telecommunications service to the project. There are existing fibre optic facilities located in Albany Street which originate in the Back Bay Central Office and the Harrison Avenue Central Office. These facilities will be extended into the project site to provide redundant service. Building 2 will also be served by conventional telephone service wiring extending from existing cables in Albany Street. The conventional wiring will be used to provide voice service and the fibre optics will be used to provide high grade data service.

An Optical Remote Module (ORM) is proposed to be provided by New England Telephone Company in Building 4 to replace conventional trunk cables and to provide fibre optic voice service to the entire site.

There will be a University Hospital data/telephone service connecting the project to medical facilities across Albany Street. A duct bank system consisting of 6-4"

conduits will extend onto the site and service each building. The system will provide:

- Telephone service from the University Hospital telephone switchboard;
- Security ties to the campus security office;
- Data links between researchers.

See Exhibit 9 - 4 for Telephone and Gas Service.

TABLE 9-2
UTILITY DEMAND LOADS

UNIVERSITY ASSOCIATES

ARCHITECTS:
CANNON, BOSTON INC.

UTILITY DEMAND LOADS

DATE:
APRIL 18, 1991

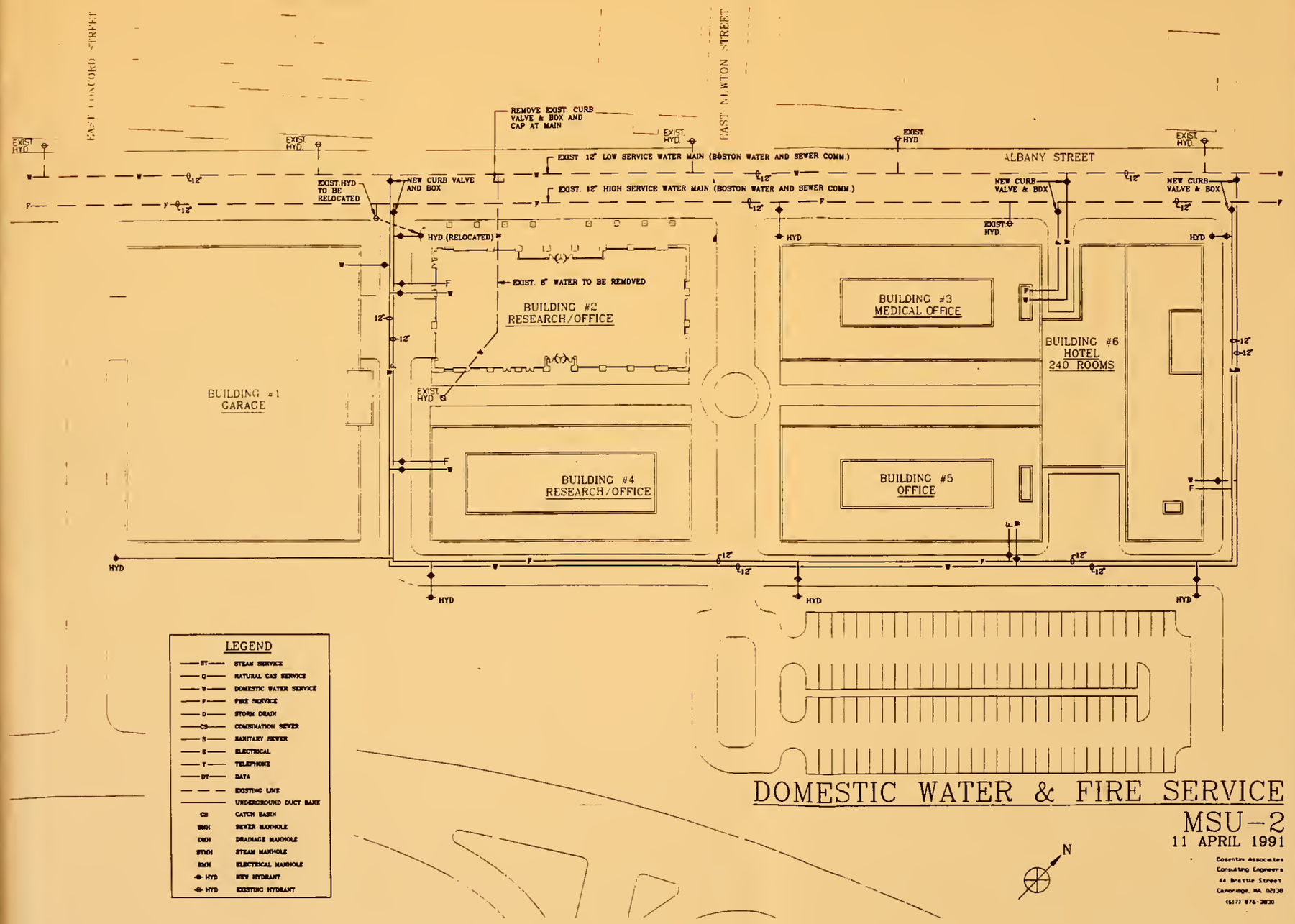
CONSULTING ENGINEERS
COSENTINI ASSOCIATES

BUILDING	STEAM LOAD		COOLING TONS	WATER			SANITARY SEWAGE GPD	STORM DRAINAGE CFS	GAS CFH	ELECTRIC KW-DEMAND	TELEPH. SERVICE
	HEAT LBS/HR	DOM. H.W. LBS/HR		DOMESTIC GPD	AC MAKE-UP GPD	FIRE SERV. GPM					
BUILDING NO. 1 GARAGE AREA——— 370,837 sq. ft. BLDG. HGT.— 82 ft.	RETAIL AND DAYCARE HEATED ELECTRICALLY		73	2,375	0	1,250	1,920	8.69	100	458	2-TELEPH. 1-FIRE ALARM 6-DATA
BUILDING NO. 2 RESEARCH/OFFICE AREA——— 180,000 sq. ft. BLDG. HGT.— 188 ft.	23,000	1,300	1827	55,280	59,050	1,000	41,220	4.22	6,500	3777	2-TELEPH. 1-FIRE ALARM 6-DATA
BUILDING NO. 3 MEDICAL/OFFICE AREA——— 180,000 sq. ft. BLDG. HGT.— 110 ft.	4,300	INDIVIDUAL ELECTRIC HOT WATER HEATER	367	13,650	10,000	1,000	11,870	4.22	1,000	1616	2-TELEPH. 1-FIRE ALARM 6-DATA
BUILDING NO. 4 RESEARCH/OFFICE AREA——— 140,500 sq. ft. BLDG. HGT.— 110 ft.	17,900	1,000	1400	33,225	45,360	1,000	22,500	4.22	5,600	3009	2-TELEPH. 1-FIRE ALARM 6-DATA
BUILDING NO. 5 OFFICE AREA——— 180,000 sq.ft. BLDG. HGT.— 110 ft.	4,300	INDIVIDUAL ELECTRIC HOT WATER HEATER	425	12,190	11,400	1,000	10,600	4.22	–	1538	2-TELEPH. 1-FIRE ALARM 6-DATA
BUILDING NO. 6 HOTEL-240 ROOMS AREA——— 186,000 sq. ft. BLDG. HGT.— 100 ft.	5,200	1,000	370	40,900	14,300	1,500	32,700	5.09	5,250	1396	2-TELEPH. 1-FIRE ALARM 6-DATA
Totals	54,700	3,300	4,482	157,620	140,110	1,500*	120,810	448.44**	18,650	11,796	

* Fire service GPM: should not be totaled - maximum anticipated flow for any building would be 1500 GPM.

**Storm drainage is based on building area only, parking lot etc., are not part of this calculation.

Source: Cosentini Associates



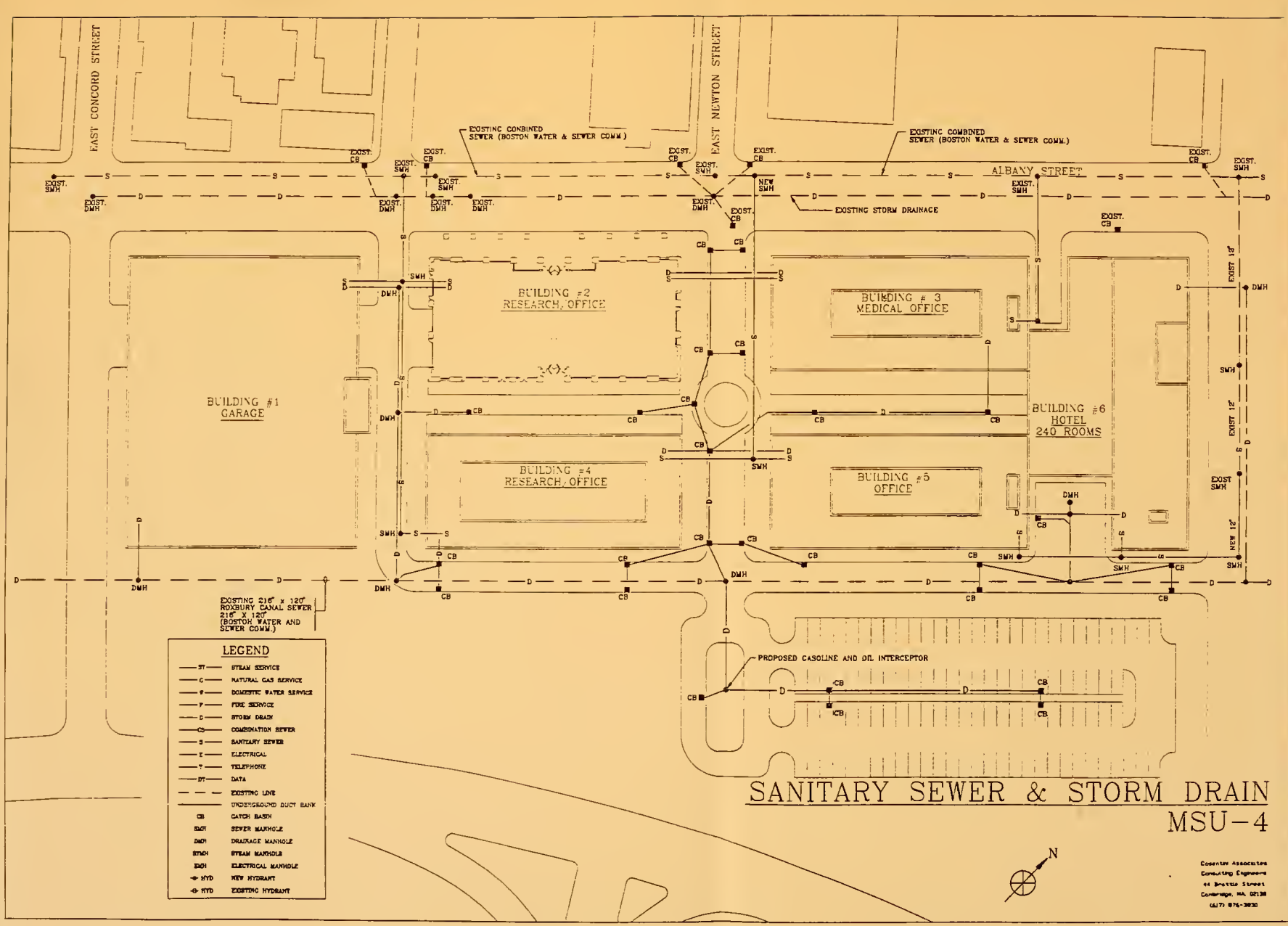
UNIVERSITY ASSOCIATES

Domestic Water & Fire

Exhibit 9 - 1

Prepared by:
Cosentini Associates

NOVEMBER, 1991



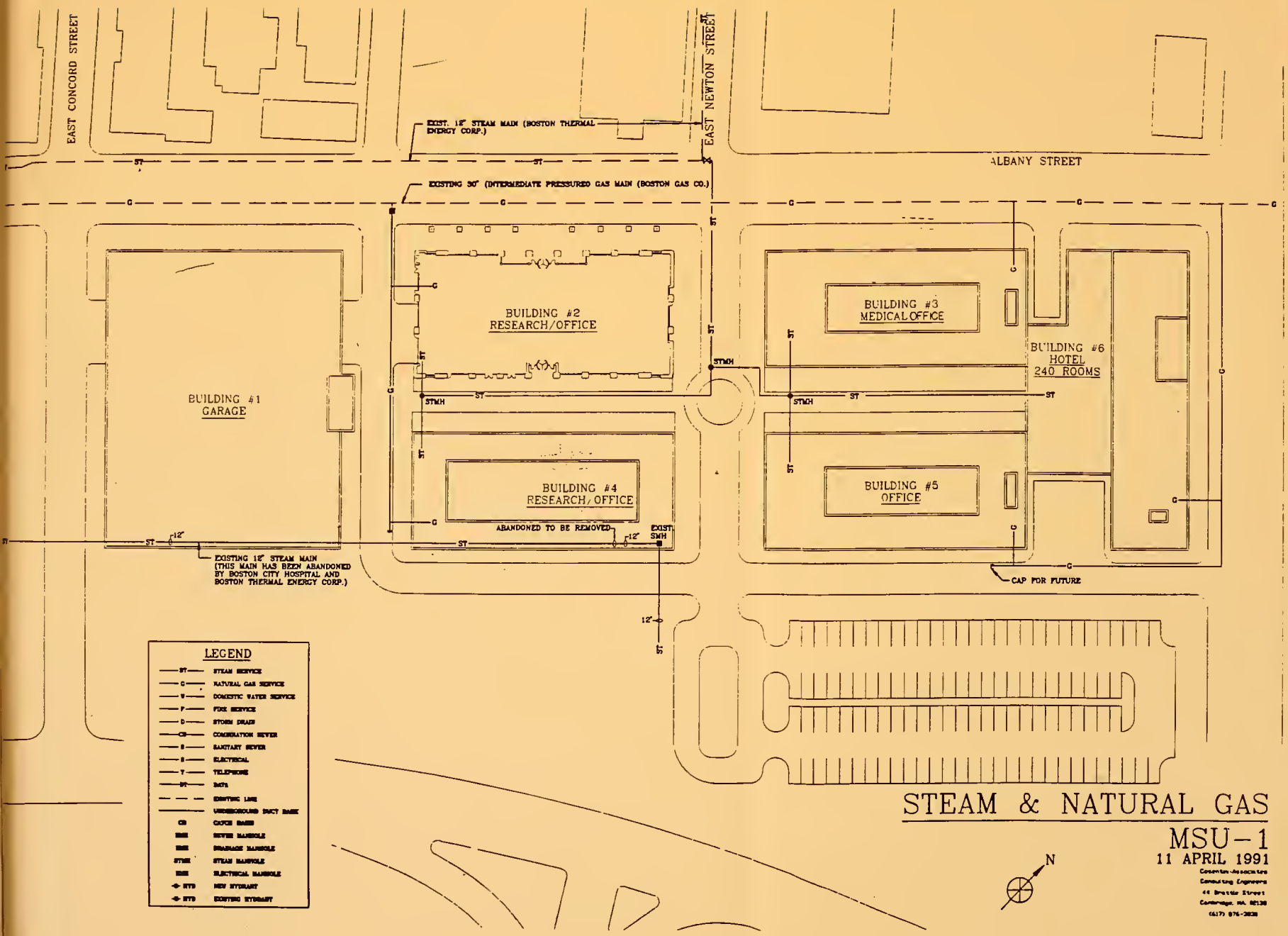
UNIVERSITY ASSOCIATES

Sanitary Sewer & Storm

Exhibit 9-2

Prepared by:
Cosentini Associates

NOVEMBER, 1991



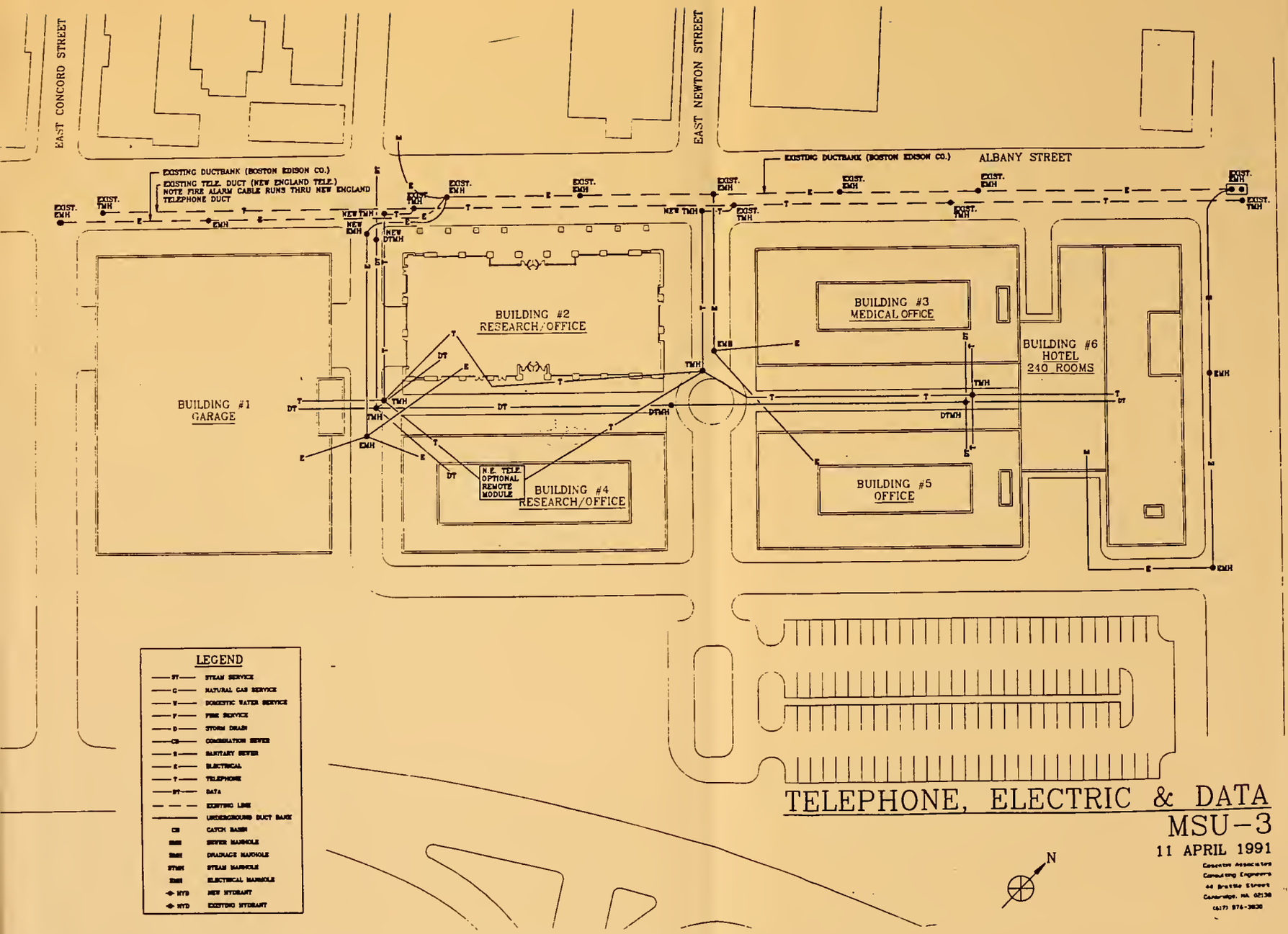
UNIVERSITY ASSOCIATES

Steam & Natural Gas

Exhibit 9-3

Prepared by:
Cosentini Associates

NOVEMBER, 1991



UNIVERSITY ASSOCIATES

Telephone & Electric

Exhibit 9-4

Prepared by:
Cosentini Associates

NOVEMBER, 1991

10.0 SOLID AND HAZARDOUS WASTES

10.0 SOLID AND HAZARDOUS WASTES

10.1 INTRODUCTION

An evaluation of the University Associates project site was conducted to assess the presence of oil and/or hazardous materials. The evaluation is based on the review of readily available information on the site's history, site usage, subsurface soils, observations of surface ground conditions, subsurface field explorations, and chemical testing of soil samples. Accordingly, an Excavated Soils Materials Management Plan (ESMMP) has been prepared for project construction (located in Appendix J).

Handling and disposal of any special materials and wastes associated with medical research and medical office tenants on-site will be the responsibility of the tenant performing these activities. However, building design and specifications take into consideration special requirements which may be needed to accommodate safe handling of materials which may be involved in these activities. Furthermore, the cooperative agreement between the BRA and the proponent reinforces conditions for compliance with all applicable regulations and for coordination with the neighborhood Project Advisory Committee.

10.2 HISTORY OF SITE FILLING

The colonial shoreline passed through the site as discussed in Section 4.0, Historic Resources. The Albany Street area of Boston was filled during the mid-1850's and was soon developed with numerous one and two story brick buildings supported by wood pile foundations. During initial filling, a narrow canal known as the Roxbury Canal was constructed along the south end of the site, approximately 250 feet south of Albany Street. Following the Civil War, the site was used by the City of Boston for municipal services. A mooring slip was constructed up to Albany Street adjacent to the former City Swill House at the east end of the site. The slip was partially filled in the 1930's and the canal was filled in the 1960's and early 1970's, at which time the site was utilized as a parking area.

10.3 EXISTING CONDITIONS

The site is currently paved and relatively flat. Ground surface elevations vary from approximately 11 to 14 feet above Mean Sea Level. No structures currently exist on the site.

10.4 OIL AND HAZARDOUS MATERIALS

A preliminary oil and hazardous material site investigation was conducted at the site in 1986 for University Associates as part of an initial Master Plan phase. The purpose of this evaluation was to assess the potential presence of oil or hazardous materials at the site to determine the applicability of MGL Chapter 21E. This evaluation included site history research and a limited subsurface exploration and chemical testing of soil and groundwater samples.

Additional environmental evaluations are currently in various stages of development for the individual parcels that comprise the site, with work progressing in conjunction with the geotechnical foundation design evaluation. The most recent evaluations consist of the following:

- Subsurface exploration program consisting of 27 test borings and observation well installations, and 14 test pits.
- Soil vapor sampling consisting of 109 probes.
- Ground penetrating radar survey to locate possible buried tanks.
- Sampling and chemical testing of soil and groundwater.

Supplemental auger holes were bored within the limits of Parcels A and B to collect additional near surface soil samples for chemical testing so as to better determine the degree and extent of contamination within the Phase I construction area.

Chemical testing of soil and groundwater indicates that the site contains elevated concentrations of total petroleum hydrocarbons in localized areas near locations of former underground storage tanks and above grade petroleum storage houses. Elevated concentrations of lead and mercury were detected in the soil. Trace levels of volatile organic compounds also were detected in the groundwater at some areas of the site. PCBs and pesticide compounds were detected in some soil samples within the limits of the former Roxbury Canal generally at depths exceeding 15 feet. Trace levels to non-detectable levels of PCBs and pesticides were detected in the groundwater within the limits of the former canal.

The types and concentrations of the compounds detected at the site are consistent with previous site usage and do not constitute an imminent hazard to human health, safety or welfare, or to the environment. PCBs are very immobile in the environment and were encountered at a depth that would preclude human contact within the proposed construction limits.

Some areas of the site will require additional evaluation and soil or groundwater remediation. It is anticipated that site remediation would occur during construction of the project. A risk assessment will be conducted for each Parcel as it is developed to identify points of exposure to on-site contamination and evaluate the risk to health by contact with the contaminated media based on the current and reasonably anticipated exposure point concentrations both during and after construction. The risk assessments will consider sensitive receptors such as the daycare center participants and other persons who may come in contact with contaminated soil and groundwater.

The risk assessment performed for the parking garage (Building 1) will focus on the area of the site planned for the daycare facility. It is probable that the risk assessment will conclude that remedial action will be necessary to prevent exposure or contact with subsurface soils within the children's daycare center exterior play area. The remedial action plan would most likely consist of installation of an impermeable barrier, probably high density polyethylene, placed beneath the exterior play area.

10.5 OPERATING & DISPOSAL PLAN

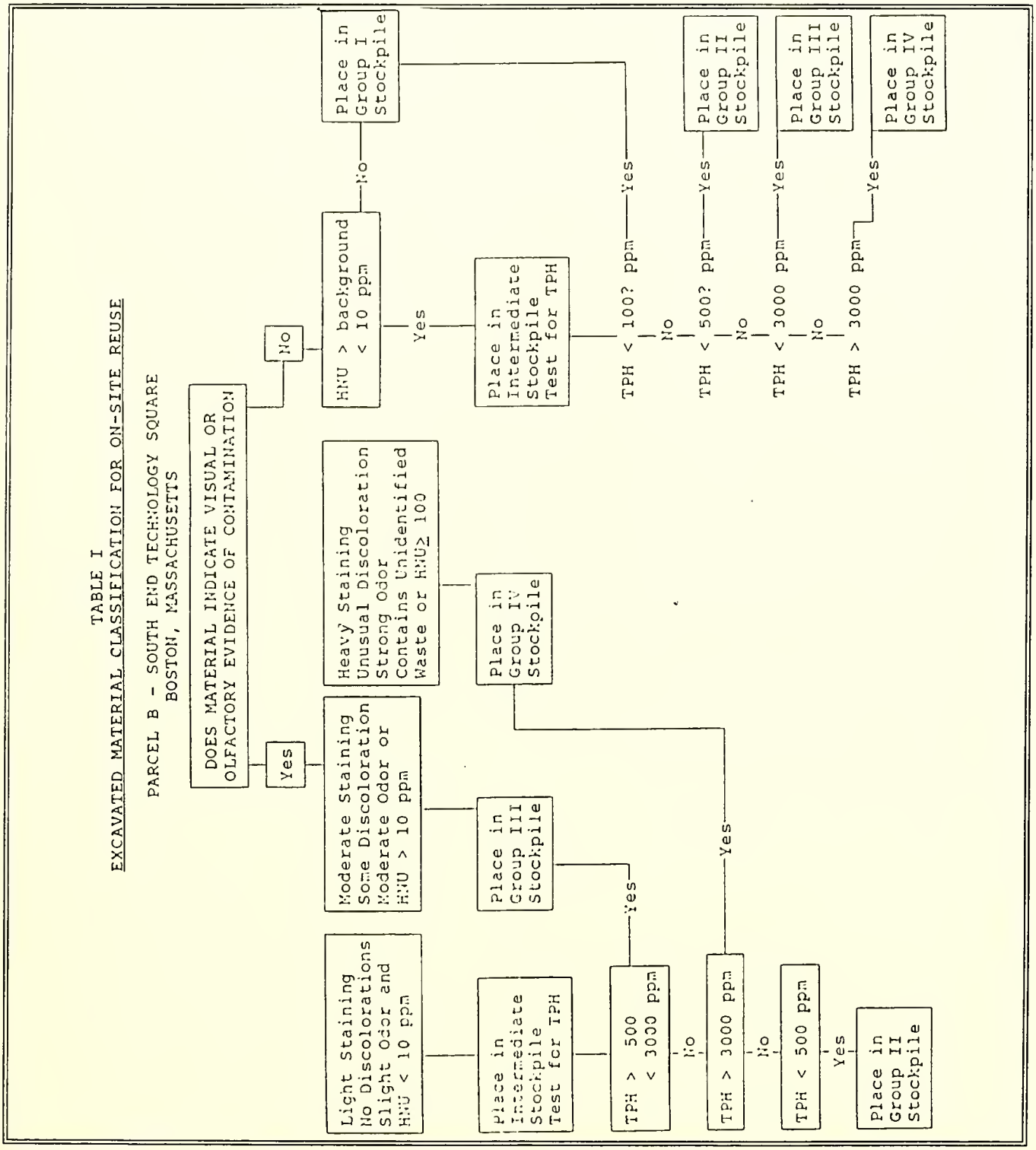
During construction, special handling and proper disposal of contaminated soil materials will be required, if such materials are encountered within the limits of the excavation. An ESMMP has been developed as part of the construction documents for work at the site. The ESMMP outlines procedures for on-site classification, handling and testing, and guidelines for disposal of excavated material. Excavated soils will be classified and stockpiled on-site according to established field screening criteria. Excavated soil will be reused as backfill material to the extent possible to minimize the need for off-site disposal of excess material. (See Appendix J, ESMMP) Exhibit 10 - 1 illustrates the process which will be used to implement the ESMMP. Similar plans will be implemented for each building in the project.

10.6 SPECIAL WASTE

The University Associates medical research facilities and medical offices can be expected to generate wastes consistent with other similar scientific research and medical activities which are already occurring on the BUMC campus. These buildings will be equipped with special treatment systems to automatically adjust the pH of the wastewater to acceptable levels which can be introduced to the existing sewer system. The Biomedical Research Building (Building 2) is expected to be equipped with licensed incinerators which will handle animal tissue and other wastes. The proposed incinerators will significantly reduce the volume of solid

waste stored on-site and transported from the site. The resulting ash from incineration usually can be disposed of in a conventional landfill.

The BUMC already has obtained required approvals for medical activities on campus and would be responsible for obtaining all approvals necessary for similar activities on the project site. Similarly, other tenants must comply with all local, state, and federal regulations and statutes regarding the handling, generation, processing, and disposal of hazardous substances and/or wastes in conjunction with the operation of healthcare and medical research facilities.



Excavated Material Classification for On-Site Reuse

Prepared By:
Haley & Aldrich, Inc.

Exhibit 10 - 1

11.0 GEOTECHNICAL IMPACTS

11.0 GEOTECHNICAL IMPACTS

11.1 INTRODUCTION

The purpose of this section is to address potential impacts on nearby structures of constructing the proposed building foundations. Subsurface soil and groundwater conditions are summarized, construction methods are described, potential impacts are evaluated, and mitigation measures are outlined. Additional geotechnical design investigations are currently underway at the site.

11.2 SUBSURFACE SOIL AND GROUNDWATER

Information on site subsurface soil and groundwater conditions is, or will be, available from the following sources:

- Subsurface investigations consisting of 19 deep test borings drilled during February and March 1991 for foundation design of the proposed project structures.

- Subsurface investigations consisting of test borings and test pits performed for preliminary site investigations of South End Technology Square in 1986.

- Test borings conducted in 1981 for the New East Side Interceptor sewer located on the south side of the site.

- Test borings conducted for the Roxbury Canal Conduit in 1963.

11.2.1 BORING RESULTS

The available test borings and test pits indicate that the subsurface conditions at the site consist of the following generalized strata, from ground surface downward:

Miscellaneous Fill - The fill ranges in thickness from 5 to 28 feet at the test boring locations. The fill typically consists of a loose to very dense black silty medium to fine sand, with varying amounts of gravel, brick, ash, shells, and concrete. Portions of previously existing buildings, seawalls and other waterfront type construction, foundation walls and other structure elements were found buried in the fill stratum at test pit locations.

Organic Soil - Organic soils, consisting of soft to medium stiff organic silt and peat, and trace shells, were encountered at all but three boring locations. Where encountered, the deposit ranges from 4 to 27 feet thick.

Marine Deposits - A thick stratum of gray silty clay underlies the organic soil approximately 20 to 36 feet below existing ground surface. The stratum ranges from 60 to 111 feet in thickness at the test boring locations. Wood pile foundations of previous structures, wharves and seawalls were founded in this stratum.

Glacio-Marine Deposit - A stratum of glacio-marine soil ranging from 3 to 12 feet in thickness was encountered at some boring locations. The stratum generally consists of hard gray silt with little sand, gravel and clay.

Glacial Till - Glacial till ranging in thickness from 3 to 30 feet was encountered in some borings. Where encountered, the glacial till generally consists of a very dense gray gravelly coarse to fine sand with little silt and occasional boulders. The glacial till is generally distinguished from the glacio-marine deposit by its higher density and being well bonded in-situ.

Bedrock - The bedrock encountered at the site is known locally as Cambridge Argillite. The bedrock was encountered at depths ranging from 98 to 145 feet below existing ground surface. The surface of the rock is highly decomposed at some boring locations.

11.2.2 GROUNDWATER

Groundwater was encountered in the recently installed observation wells ranging from 4 to 17 feet below ground surface. Water levels observed at the groundwater observation wells as measured in 1986 typically ranged from approximately 5 to 8 feet below ground surface. Based on the previous observations, groundwater levels, in general, are not subject to tidal influence. Groundwater levels are influenced by other factors such as local construction activities, leakage in and out of sewers and storm drains, and other minor external influences. Wells within the limits of the former Roxbury Canal indicate some tidal influence between the Roxbury Canal Conduit and the buried sea wall. Tidal activity was not evident at other well locations on site.

11.3 PROPOSED CONSTRUCTION

The man-placed fill and underlying organic silt are not suitable for support of the proposed structures. The low shear strength and high compressibility of the organic soils would result in unacceptable settlement of the structures. It is also anticipated

that long-term post-construction settlement of foundations bearing within the thick and relatively compressible marine clay would be unacceptable for the proposed structures. Foundation loads, therefore, must be transferred below the fill, organic silt and marine clay to the glacial deposits or the rock. It is anticipated that the buildings would be supported on long piles driven to end-bearing in the glacial deposits or rock. Anticipated pile lengths range from 120 to 145 feet.

Relatively shallow excavations would be required for construction of below-grade pile caps, grade beams and utilities. Excavations are not anticipated to encounter groundwater except for installation of some utilities, therefore, dewatering will not generally be required. Existing groundwater levels, therefore, will not be affected by the proposed construction. A Temporary Dewatering Discharge Plan for control of surface water during construction will be filed with the city.

11.4 FACILITIES WITHIN OR NEAR THE SITE

There are no structures located within or immediately adjacent to the site which would be affected by settlement, vibration or other construction condition. The nearest buildings are directly across Albany Street. An existing chilled water plant for Boston City Hospital is located about 200 feet from the southwest end of the site. Below grade structures which are inside the site include the Roxbury Canal and the New East Side Interceptor sewer.

The Roxbury Canal Conduit, located on the south side of the site, is an 18 foot wide by 10 foot high (inside dimensions) concrete box conduit, supported on wood piles bearing in the marine clay stratum.

11.5 PILE INSTALLATION

Building foundation piles will be installed by driving from near existing ground surface. Vibrations and noise associated with pile driving are not expected to be significant outside the site limits. Heaving of the ground surface, due to volume displacement of the soil, will occur within the immediate vicinity of the pile group. Ground heave is not anticipated to be a significant adverse impact of pile installation due to the relatively low density of piles. However, piles installed adjacent to the Roxbury Conduit will be pre-augured to reduce the potential for heave movement.

Additional measures will be employed to mitigate potential adverse effects of pile driving. The project specifications will impose specific performance criteria on the contractor to limit vibrations and ground movements. Instrumentation will be installed to observe and document performance and compliance with the

specifications. The instrumentation will include elevation reference points installed on the Roxbury Canal Conduit and selected nearby structures as required.

12.0 CONSTRUCTION IMPACTS

12.0 CONSTRUCTION IMPACTS

12.1 INTRODUCTION

In this section, issues associated with temporary construction impacts of the project are discussed. These issues include air quality, noise, construction traffic and access routes, equipment and supplies staging areas, temporary parking requirements for construction workers, construction methodology, and construction schedule including hours of construction activity. Construction mitigation measures will be detailed in the Construction Management Plan (CMP) required by the City. Furthermore, the cooperative agreement between the BRA and proponent define conditions for construction some of which are included in this chapter. See Appendix D, Approvals and Agreements).

The site is presently used by area medical institutions for surface parking. The impacts of construction on the existing parking area are discussed in Section 6.0, Transportation, of this document. The Excavated Soil Material Management Plan (ESMMP) includes construction operations and mitigation for excavate, sediment control and dust control. (See Appendix J)

12.2 CONSTRUCTION PHASING SCHEDULE AND HOURS

Construction of the first phase of the University Associates project is expected to commence in the Fall 1991. Phase I of the project includes a 1,000 car parking facility, a 180,000 s.f. research building and a medical office building (Buildings 1, 2 and 3). It is anticipated that construction of Phase I will be completed within a three year period.

Construction hours are scheduled for 7:00AM to 4:00PM which is off peak for typical commuting periods. Current peak hour traffic for the Boston University Medical Center is 3:00PM to 4:00PM. Construction work hours have been chosen so as to not coincide with the current BUMC peak hour of traffic.

12.3 CONSTRUCTION STAGING AREAS AND WORKER PARKING

All storage of materials and equipment and staging for all construction activities during Phase I will occur on sub-parcels A, B and D.

The construction of the project is expected to require an average daily workforce of 75 persons, with 50% of the workers assumed to be Boston residents. Commuting is

anticipated to occur between 6:30AM and 7:00AM and 4:00PM and 4:30PM. Therefore, approximately 38 peak hour vehicle trips are expected to be generated, with the remaining workers utilizing public transportation. Parking for construction workers is planned to be located off-site on University Associates' controlled property as well as on-site in the construction staging area. No construction parking will be allowed on the Star Brush lot on East Brookline Street or Harrison Avenue as stipulated in the cooperative agreement with the BRA.

12.4 CONSTRUCTION TRUCK TRAFFIC AND ACCESS ROUTES

Construction related deliveries are expected to occur via the Southeast Expressway, limited primarily to the Massachusetts Avenue off-ramp and Albany Street. Construction vehicles will not be allowed to use East Brookline Street, East Concord Street, and East Newton Street. Construction traffic will not be allowed to use side streets. University Associates will require, as a condition of the construction contract, that sub-contractors adhere to the delivery route.

Construction related traffic is anticipated to be relatively low due to the lack of significant below-grade construction and excavation. The period of maximum activity will occur during steel erection and concrete delivery for pouring of the floors. If future design modifications include subsurface parking then below-grade activity will likely increase. Changes in construction activities and related management measures will need to be detailed in the Construction Management Plan.

12.5 AIR QUALITY

Air quality impacts during construction will be minor. A temporary increase in air contamination, such as carbon monoxide (CO), nitrous oxides (NO) and hydrocarbon exhaust emissions are to be anticipated from construction vehicle emissions. However, the number of vehicles or machinery operating on the site at any time is expected to be less than eight.

In order to minimize the generation of fugitive dust from construction vehicle activity, exposed surfaces will be kept to a minimum. Fugitive dust will be minimized by the presence of an asphalt surface which currently overlies the entire site and pavement will left in place whenever possible. Mitigating measures also include the use of covered trucks. Dust control measures include wetting down the site and/or spreading hygroscopic salts. Excavate and debris will be covered and located away from pedestrian areas and the daycare center. There will be periodic cleaning of affected streets and areas near pedestrian activity and the daycare

center. Debris will be removed from the site on a periodic basis and full dumpsters will not remain on site longer than 24 hours.

The demolition and reconstruction of the Massachusetts Avenue Connector in conjunction with the CA/T project also will include measures to minimize dust and other emissions. These are discussed more fully in Section 12.12 of this Chapter.

12.6 WATER QUALITY

Groundwater and surface water from rainfall or pile pre-augering will be pumped from the excavation area as necessary to permit construction to take place in-the-dry. Water will be pumped to sedimentation tanks to remove fines prior to discharge. Following sediment removal, water will flow by gravity to a holding tank. Periodic sampling and chemical testing will be performed on the water collected in the holding tank. If chemical testing indicates that the water meets the discharge criteria established by the Environmental Protection Agency (EPA) and the Boston Water and Sewer Commission (BWSC), the water will be discharged into the Roxbury Canal Conduit. In the event that the established criteria is exceeded, water will undergo on-site or off-site pretreatment to remove contaminants prior to discharge.

A Temporary Dewatering Discharge Plan to control surface water will be submitted to the EPA and the BWSC and discharge criteria will be within the conditions defined in the permits.

12.7 NOISE/VIBRATION

Cranes, trucks and other heavy equipment will produce noise and vibration. Sensitive receptors for noise impacts include the residential neighborhood, nearby medical facilities of Boston City Hospital, The University Hospital, and the Boston University Medical School. Construction activity will be planned to minimize noise impacts on these receptors. No construction will occur before 9:00AM on Saturdays. No pile driving will occur before 8:00AM on weekdays or before 9:00AM on Saturdays. Pile driving activities are estimated to occur for a 6 to 8 week period for each building.

Blasting will not be necessary to construct the project. Building foundation piles will be installed by driving near the existing ground surface. Pre-augering for piles will be implemented near sensitive receptors. Pile cavities will be pre-augered through the fill stratum to a maximum of 30 feet below grade to probe for obstructions. Deeper pre-augering to the bearing stratum will not be necessary given that the pile will penetrate through the soft clay soils under the static weight of the pile and

hammer without driving. A solid fence near the daycare center and along Albany Street will be erected to reduce noise and dust. Vibration/noise monitoring of pile driving will be implemented to document compliance with specifications. Noisy machinery will be located away from sensitive receptors and operations limited to conditions set forth in the cooperative agreement with the Boston Redevelopment Authority and CMP. Use of quiet models of equipment will be encouraged and noise control equipment such as mufflers will be inspected to assure they are in good working order.

12.8 OFF-SITE COORDINATION

To minimize the duration of street disruption from construction activities, the University Associates project will be coordinated with improvements planned by the City within Albany Street. Construction planned for Boston City Hospital will be reviewed to determine possible impacts on the project. Replacement parking during construction will be provided and is described in detail in Section 6.0, Transportation. Coordination measures are defined in the agreement between the BUMC and Boston Public Facilities Department. (See Appendix D, Approvals and Agreements.)

12.9 PUBLIC SAFETY

Currently the site is fenced at the perimeter along Albany Street. Additional fencing will be erected to separate existing parking areas from the Phase I construction site. The public sidewalk will be retained and a covered walkway will be erected for pedestrian safety. Albany Street will be cleaned of construction debris daily. Signage relating to construction will be posted in accordance with the city Inspectional Services Department (ISD) and the U.S. Occupational Safety and Health Administration (OSHA).

12.10 RODENT CONTROL

Rodent populations in Boston include Norway rats and house mice. The current availability of food sources support populations inside and outside of buildings in surface and subsurface environments.

Construction activities tend to disrupt rodent habitats by eliminating food, shelter and movement routes. The amount of disruption is linked to the type of construction work and its effect on pre-existing rodent habitat.

The proponent will establish an Integrated Pest Management plan (IPM) to control the rodent population during construction activities as mandated by ISD. This plan

will include sanitation, rodent-proofing, public education, and poison baiting. The IPM efforts will be maximized prior to construction to reduce the rodent population.

Poison-baiting will be implemented regularly under the direction of licensed pest control professionals and will include the use of registered rodenticides. Regular inspections will be conducted, including monitoring of the daycare center and other special areas of concern.

12.11 SOLID WASTE MANAGEMENT

Construction debris will be stored in trailer dumps at the site and removed periodically to control waste. In no event will a full construction dumpster remain on site longer than 24 hours. Details of handling, transporting, and disposal of excavate are contained in the ESMMP and discussed in Section 10.0, Solid and Hazardous Materials.

12.12 CA/T CONSTRUCTION

Reconstruction of the Massachusetts Avenue Connector is included in the CA/T project. This will involve ramp demolition as well as the at-grade construction of the road. Construction impacts and mitigation measures are presented in the Supplemental Draft and Final Environmental Impact Statement/Report for the CA/T project. They include similar measures to the University Associates project for air pollution, noise/vibration, and rodent control. These are discussed in Sections 7.0, 8.0 and 12.10 respectively. The CA/T documents also provide a section addressing bridge and viaduct demolition mitigation measures. These include the use of tarpaulins for dust control and special provisions for handling materials containing lead, as well as management for transportation of all materials.

13.0 RESPONSE TO COMMENTS

13.0 RESPONSE TO COMMENTS ON THE DPIR

The following section provides responses to the Adequacy Determination issued by the Boston Redevelopment Authority and comment letters received on the DPIR/DEIR. The following is a list of agencies and organizations which provided letters on the DPIR.

1. Boston Redevelopment Authority - Adequacy Determination
2. Massachusetts Historical Commission
3. Massachusetts Department of Public Works
4. Executive Office of Transportation and Construction
5. Boston Area Bicycle Coalition
6. Blackstone/Franklin Square Neighborhood Association
7. Boston Environment Department
8. Massachusetts Water Resources Authority
9. Boston Water and Sewer Commission
10. Boston Redevelopment Authority
11. Metropolitan Area Planning Council

1. BOSTON REDEVELOPMENT AUTHORITY

From: Gerard Kavanaugh

Date: October 18, 1991

BOSTON
REDEVELOPMENT
AUTHORITY

Raymond L. Flynn
Mayor

One City Hall Square
Boston, MA 02201
TEL (617) 722-4300
FAX (617) 367-5946

October 18, 1991

Mr. Robert Walsh
Walsh Associates
307 West First Street
Boston, MA 02127

Re: University Associates Project

This letter is the Preliminary Adequacy Determination (the "Determination") of the Boston Redevelopment Authority (the "BRA") with respect to the Draft Project Impact Report (the "DPIR") for the proposed University Associates Project (the "Proposed Project"), submitted to the BRA on June 20, 1991.

The BRA is issuing this Determination pursuant to Section 31-5 of the Boston Zoning Code (the "Code"). This Determination requests information required by the BRA for its review pursuant to Article 31 of the Code.

PREAMBLE

The BRA is reviewing the Project pursuant to multiple sections of the Code. The Proposed Project is being reviewed pursuant to Article 31 of the Code, Development Review Requirements, which sets out a comprehensive procedure for project review, and requires the issuance of a Final Adequacy Determination prior to issuance of a building permit. The Final Adequacy Determination is issued upon determination by the BRA that the Final Project Impact Report (the "FPIR") is satisfactory.

In addition, the Proponent has requested that the project site be designated a Planned Development Area ("PDA"), rather than an Urban Renewal Area ("U") Subdistrict, as initially requested, and has proposed a Master Plan for the development of the PDA. To be granted such a designation, the BRA must approve a Master Plan and Development Plan after a public hearing and petition the Boston Zoning Commission to designate the site as a PDA, pursuant to Article 3-1A of the Code.

The Proposed Project also requires Development Impact Project ("DIP") Plan approval, pursuant to Article 26A of the Code. Prior

o receiving zoning relief, the Proponent must meet the DI
equirements, pursuant to Sections 26A-3 and 26B-3 of the Cod
hese requirements include that the BRA approve the DIP Plan aft
public hearing, and that the Proponent enter into a DIP Agreement
ith the BRA.

he Proposed Project may also require exceptions under Article 6A
f the Code for the following deviations from the code:

- Floor Area Ratio
- Off-street loading
- Off-street parking
- Uses

onditions for approval of exceptions are outlined in Section 6A-3
f the Code.

inally, the Proposed Project is located within the South End Urban
enewal Project Area. Consequently, approval of the Proposed
roject may require that the BRA amend pertinent provisions of the
outh End Urban Renewal Plan. In addition, the Proposed Project
ill require a Land Disposition Agreement between the BRA, the City
f Boston, and the Proponent regarding the sale and conveyance of
arcel 46B.

ecause the review requirements discussed above address related, but not identical, issues, the BRA is incorporating its review of zoning relief for the Proposed Project into the Article 31 process to eliminate regulatory duplication and to consolidate the Proposed Project's review into one process and one set of documents.

PROJECT REVIEW

But for the required corrections, clarifications, and additional information referenced in the attached Technical Appendix, the DPIR submitted is sufficient to satisfy the scoping requirements.

We look forward to reviewing the Final Project Impact Report.

Sincerely,

Gerard Kavanaugh
Director of Institutional Planning

TECHNICAL APPENDIX
TO THE
PRELIMINARY ADEQUACY DETERMINATION
FOR
UNIVERSITY ASSOCIATES PROJECT

A. DEVELOPMENT REVIEW REQUIREMENTS - ARTICLE 31

Article 31 of the Code institutes a process by which large-scale development projects will be reviewed by the BRA. In its review of the DPIR, the BRA has identified certain components which are insufficient and which the Proponent must modify, and additional information which the BRA requires in order to issue a Final Adequacy Determination. The following is a description of the sufficiency of the materials submitted in the DPIR, and the additional materials which the Proponent must include in the FPIR.

1. PROJECT SUMMARY

The DPIR states in the Project Summary that the Proposed Project will be located on an approximately 16 acre site. In other sections of the document, however, the project site is listed as approximately 7.5 acres. This discrepancy should be clarified. A description of metes and bounds or a certified survey of the project area should be included in this section as well as in the Project Description Section (See number 2 below). (1.1)

The Project Development Team does not list a landscape architect. If there is one for the Proposed Project, that individual or firm should be identified. (1.2)

The discussion on site control of the project site states that the majority of land is owned by the City of Boston and the BRA, and that a portion of the site will be acquired from the Commonwealth of Massachusetts after the completion of the Central Artery/Third Harbor Tunnel ("CA/THT") project. A map identifying property ownership as well as a detailed accounting of property ownership should be included in this section or the Project Description Section. In addition, all encumbrances and ownership issues related to the project site should be described in the FPIR, including the nature of the agreements necessary to secure these encumbered parcels. (1.3) (1.4)

The Proponent has requested an MPDA and PDA designation for the project site, rather than a "U" Subdistrict designation as initially requested in the DPIR. Existing zoning requirements, and any anticipated requests for zoning relief under an MPDA and PDA designation should be explained in the FPIR. (1.5)

2. PROJECT DESCRIPTION

The Site Plan (Exhibit 4), Site Boundaries (Exhibit 10), and Parcel Plan (Exhibit 11) all show different boundaries, creating confusion as to what is the actual site being developed. A description of metes and bounds or a certified survey of the project site should be included in this section. The correct site should then be identified and reflected in all exhibits in the FPIR. 1.6

The DPIR estimates that the Proposed Project will provide more than $4 million in annual real estate taxes following its completion. If agreements are to be executed regarding the phased acquisition of parcels, the nature of these agreements and their impacts on estimated property taxes should be described in the FPIR. 1.7

The Proposed Project includes the placement of a child care center within the garage structure, with an outdoor play area between the garage and the Massachusetts Avenue Connector. This appears to be an inappropriate location for a child care center. The only perceived benefit of the proposed location is that the play area would receive the maximum amount of sun during the day. Peak hour traffic passing the outdoor play area is estimated at 2,000 to 2,100 vehicles. Issues of air quality, noise, and safety are of obvious concern. An analysis of air quality and noise (from traffic, the proposed garage, and future construction phases) as well as safety must be included in the FPIR. Mitigation measures must also be presented, including measures relating to the existence (and demolition) of the overhead ramp which directly abuts the child care play area and which will remain in place until the final stages of construction of the CA/THT (see numbers 7 and 8 below). 1.8 1.9

The DPIR states that the child care center will be available to employees. No information is provided on whether slots will be available for non-employee community residents. The number of slots and the criteria for determining eligibility for community residents, if proposed, should be identified. Information regarding financial assistance or subsidies to employees or non-employee community residents, if proposed, also should be presented in the FPIR. 1.10

The discussion of the Proposed Project's phasing is incomplete. A tentative development and construction phasing schedule for all structures which comprise the Proposed Project, including the phasing of all infrastructure improvements, public and private open space, and parking and site access, must be presented in the FPIR. Phase I should include a substantial portion of the proposed infrastructure improvements and open space initiatives for the entire Master Plan, and these improvements should be described (see number 13 below). In addition, a discussion of the impacts of the CA/THT on the construction and phasing of the Proposed Project, including the phasing of all parking and site access needs, must be presented in the FPIR (see number 6 below). 1.11 1.12

The DPIR estimates the total project cost at $200 million. The Proponent should present costs for the individual components of Phases I and II in the FPIR. 1.13

Corrections:

- Page 2-5 (last paragraph) should read "Exhibits 6-9."
- Page 2-10 (last paragraph) should read "Table 3." 1.14
- The writing on Exhibit 15 is not possible to read.
- On page 2-38, reference to Exhibits 21-28 should read "28-35."
- The titles on Exhibits 34 and 35 should be reversed.

3. SHADOW

Because of the orientation of the buildings, the pedestrian plazas will be in shadow for most of the year, with the least impact occurring at midday during the summer season. Mitigation measures addressed in the master planning and design review process would seem appropriate to mitigate this impact (see number 13 below). Buildings located across Albany Street from the site will be affected only in the morning hours, and the rear of the residences along East Brookline Street will be shaded by the proposed hotel in the winter mornings. 1.15

4. HISTORIC RESOURCES

The Proposed Project is located in the South End Harrison/Albany Protection Area, and is therefore subject to review by the South End Landmark District Commission. Prior to the issuance of a building permit, a certificate of design approval must be issued by the South End Landmark District Commission. 1.16

The height of the proposed Research Building (144 feet, plus 24 foot mechanical penthouse) most comply with the standards for the Protection Area. Additions or penthouses be allowed if they are not visible from the nearest public way within the Landmark District. 1.17

The FPIR must restate and document the assertion that the Proposed Project will have no impacts on archaeological resources. 1.18

5. WIND

A quantitative wind analysis was required by the Scoping Determination. Only a qualitative analysis was presented. A quantitative (hot-wire) wind tunnel analysis must be included in the FPIR. 1.1

The qualitative analysis did indicate that there are potentially several areas where unacceptable wind conditions would occur as a result of the Proposed Project, and in some cases the BRA threshold could be exceeded. Particularly windy areas are identified along Albany Street, along the service lane, and within the proposed pedestrian plaza, which would be particularly affected by the northwest (winter) winds. These excessive winds, together with the shadow impacts identified above, would tend to make the pedestrian plaza an unpleasant and uncomfortable place for pedestrian activities. Also, building corners will be particularly subject to accelerated winds. Design (massing) modifications may be necessary to reduce the wind impact. Other mitigation measures that should be considered in the FPIR include building setbacks, canopies, and extensive landscaping (see number 13 below). 1.2

Exhibits 54 - 71 should show the larger study area to include the buildings which would influence wind conditions on the site. 1.2

Corrections:

- The statement on the BRA wind criterion (paragraph one, page 5-6) should be restated to say that the effective gust velocity should not exceed 31 mph. 1.2
- On page 5-6 (end of third paragraph) reference to Exhibit 61 should be Exhibit 56.

6. TRANSPORTATION COMPONENT

The Boston Transportation Department ("BTD") is currently drafting a Transportation Access Plan ("TAP") Agreement for execution between the City of Boston and the Proponent. A TAP Agreement must be finalized prior to the formal submission to the BRA of Design Development documents. 1.2

Table 14 shows modal splits for work and non-work trips for the different land uses. Sources given are previous studies. Most of the factors appear reasonable, with the possible exception of non-work trips for the hotel and research facilities, where the walk percentages are 35 and 50 percent respectively. The source studies should be presented in the supporting documentation. 1.24

The Project-Generated Parking Demand Table in Appendix F does not provide the restaurant generation rate, which should be included 1.25

with all other uses.

There is no analysis of the impact of project-generated trips on the capacity of the existing (or future) public transportation facilities. This analysis must be provided in the FPIR. 1.26

There is no analysis of future pedestrian circulation impacts, including a level of service ("LOS") analysis. This analysis must be provided in the FPIR. 1.27

The mitigation discussion indicates that even with the proposed mitigation measures, the Massachusetts Avenue/Melnea Cass Boulevard intersection will operate at an unacceptable LOS-F in the evening peak hour. Further mitigation measures should be investigated. 1.28

The DPIR documents that in five intersections, the LOS in either the a.m. or p.m. will be degraded between the No-Build and Build conditions. These findings indicate the need for an aggressive mitigation program in the TAP Agreement. 1.29

Exhibit 90 shows one proposed loading dock to be located off Albany Street (between the hotel and medical office building). The mitigation section indicates that there will be no impact on the local street system due to truck backing or queuing. However, trucks would have to back into this Albany street loading dock, thereby affecting local street traffic. This conflict needs to be resolved. Among the analysis of mitigation measures, alternative locations for this loading dock should be investigated in the FPIR. 1.30

On page 2-32, the DPIR states that there will be direct access to the proposed garage from both Albany Street and the Massachusetts Avenue Connector via the extension of East Concord Street. However, Exhibit 91 and the text on page 6-69 indicate that the East Concord Street extension will be a one-way street exiting onto Albany Street. The Albany Street entrance will therefore not be accessible via the East Concord Street extension. Access routes to the garage should be clarified in the FPIR. 1.31

No analysis is provided regarding the changes in parking supply and demand during the project timetable. Specifically, the supply should be identified for each development phase, and a discussion should take place on how each individual phase affects the overall total supply versus the expected demand. 1.32 The planned acquisition or construction of additional parking sites should also be included. Reference is made in several places to a second garage, but no location or schedule is described. This should be clarified. 1.33 A discussion of timing should be presented as well, particularly the timing of development of Phase II within the context of the construction of the CA/THT. This discussion should include an analysis of impacts of changes in the expected schedule of construction of the CA/THT. Maintenance of adequate parking during all phases of construction must be guaranteed. The FPIR 1.34

must describe and illustrate how this will be accomplished.

The impacts on the entire Boston University Medical Center ("BUMC") complex resulting from parking that will be displaced during phased development and following full build should be discussed in the FPIR. Necessary agreements between Boston City Hospital ("BCH") and the Proponent regarding parking should also be explained. 1.35

The discussion of existing off-street parking should include information about employee, patient, visitor, or resident use. Future parking conditions should include a discussion about how and where short-term patient and visitor parking will be accommodated during development phases and following full build. The amount of short-term public parking available in the proposed garage should also be presented in the FPIR. 1.36

The parking analysis indicates that there will be a small surplus of parking spaces in the year 2000. This analysis is unclear as to whether it accounts for any possible future needs of BCH or BUMC. The source for the 250 space reduction in demand by BCH must be provided in the FPIR. 1.37

Surface parking for 90 spaces is included in the site plan. The Scoping Determination states that "(s)urface parking should not be permitted on the project site." The Proponent has committed to provide all parking on the project site in structured parking facilities at full build. This commitment must be reflected in the site and parcel plans in the FPIR (see number 13 below). 1.38

In Table 18, the assumption is made that all Turnpike traffic will take the Southeast Expressway. While this is theoretically true now, in the future it is expected that the left turn from Massachusetts Avenue onto the Turnpike will be made legal and be given an exclusive lane. As a result, it would be more attractive for Turnpike users in the p.m. to access the Turnpike via Massachusetts Avenue west. This potential change should be noted in the FPIR. 1.39

On page 6-49, the DPIR states that the LOS at the Berkeley/Albany intersection will improve due to the CA/THT project. It is not clear that this assumption is correct, particularly since the plans for the Broadway Bridge are now being reconsidered. This uncertainty should be noted in the FPIR. 1.40

In figures 74, 75, and 85-88, there is a discontinuity in the link between the Malden/Albany and East Brookline/Albany intersections. This should be explained. 1.41

Corrections:

- Page 6-5 (first sentence) begins with an incomplete sentence. 1.42

- On page 6-14 (last sentence) the reference to Table 7 should be Table 9.

- Page 6-16 (first sentence) should be corrected to note that only 3 unsignalized intersections (not 4) operate at LOS D.

- It should be noted that the Orange Line does not pass through the study area if the study area is defined as Exhibit 72.

- Exhibit 78 should be corrected to show that Bus Route 1 goes to Dudley Square.

7. AIR QUALITY

If the outdoor play area of the child care center is to be located, as proposed, at the corner of the Massachusetts Avenue Connector and East Concord Street, an air quality analysis is required to be performed at this location as well (from traffic, the proposed garage, and future construction phases), since the play area will be a sensitive receptor. This analysis, along with mitigation measures, must be included in the FPIR. 1.43

Corrections:

- CAL3QHV (1st line, last paragraph, page 7-4) should be CAL3QHC. 1.44

8. NOISE

The discussion of noise is minimal and does not comply with the Scoping Determination. A detailed discussion of noise impacts is required for the FPIR. 1.45

The DPIR does not evaluate the effect of noise levels on the child care center's outdoor play area, either during the construction of Phase II, during demolition of the Massachusetts Avenue Connector, or following full build. If the child care center play area is to be located within the proposed site, an analysis of noise impacts, along with mitigation measures, must be included in the FPIR. 1.46

9. INFRASTRUCTURE

The Technical Appendix (Appendix H) contains calculations of utility demand loads, and they are summarized in Table 32 of the DPIR. No totals, however, are provided in Table 32, making it difficult to analyze the discussion. The FPIR should include total figures for utility demand loads in Table 32. 1.47

The DPIR does not provide an analysis of the adequacy and capacity of the infrastructure systems to serve the site (only BWSC hydrant data is supplied). In order to analyze the impacts of projected utility demand loads, information on the capacity of the systems expected to support these loads must be provided. Documentation of contact with the utilities and a description of the utilities' ability to provide necessary levels of service must be presented in the FPIR. 1.48

In Table 31, the high service flow rates are lower than those of low service, although the available flow of water is greater. Given the doubled pressure in the high service line, this merits an explanation. 1.49

The discussion of sanitary sewer (page 9-3) indicates that sanitary sewerage would be connected to a 66" x 68" brick sewer within Albany Street. Exhibit 104 shows that the sewage lines from the project connect to a 30" x 52" combined sewer line. This discrepancy must be clarified. Any additional catchbasins connecting to the Albany Street 30" x 52" sewer for storm drainage should be indicated. All existing (to be removed or retained) and proposed utility connections should be shown. 1.50

Exhibit 104 appears to indicate that telephone services (fibre optics, conventional service, duct system crossing Albany Street) are all in the same service line. The accuracy of this exhibit should be clarified. The direction of utility origin, if applicable, should be indicated on this exhibit as well. 1.51

Discussion of potential recycling or conservation measures should be presented in the FPIR, such as seasonal cooling tower blowdown reuse or recycling of steam condensate. 1.52

Special precautions must be taken to avoid any damage, from vibration or movement, to the sewage and drain structures passing through the site. Such precautions are implied in the Geotechnical Impact Section, but should be referenced and defined in the Infrastructure Section as well. 1.53

10. SOLID AND HAZARDOUS WASTE

The DPIR concludes that existing site contamination (petroleum products, solvents, PCBs) do not constitute an imminent hazard to human health, safety or welfare. The presence of PCBs could be extremely hazardous. More detailed information, including past and current site investigation reports, should be provided in the FPIR. Evaluation of the potential hazards and impacts on the child care center play area is particularly critical, and should be specifically addressed as well. 1.54

The air quality impacts of on-site incineration of biological (and other) wastes should be evaluated by the user and the data submitted to the authority in accordance with the cooperation 1.55

agreement. The impacts of special wastes generated by the research facilities should be evaluated as well.

The Scoping Determination required a description of proposals for recycling and reduction of waste generation. A description of such proposals must be included in the FPIR. 1.56

11. GEOTECHNICAL IMPACTS

The information presented in the DPIR represents an acceptable study of geotechnical impacts on the project site.

12. CONSTRUCTION IMPACTS

Wetting of the site to minimize fugitive dust as well as other standard dust suppression measures is recommended and should be included in the FPIR. 1.57

Sedimentation tanks/basins should be provided for the removal of sediment from groundwater and runoff prior to discharge into the Roxbury Canal Conduit. This matter should be addressed in the FPIR. 1.58

Pre-auguring for selected piles is recommended to reduce off-site noise, since pile driving produces extremely high noise levels and the Proposed Project is adjacent to hospital facilities and residences. This matter should be addressed in the FPIR. 1.59

No discussion is presented on construction impacts as they relate to (and are affected by) the construction of the CA/THT. These impacts and coordination with the CA/THT, along with mitigation measures, must be addressed during the master planning process. 1.60

The FPIR must provide information regarding the frequency of application of poison-baiting for rodent control measures. 1.61

13. URBAN DESIGN

The FPIR must include an Urban Design component as required by the Scoping Determination. In addition to the planning and design drawings submitted in Chapter 2.0, Project Description, the Urban Design component of the FPIR must include the following items: 1.62

1. Master plan options that address the problems of wind, shadow, narrow dimensions, and conflicts with service and parking access in the areas intended to be public open space; specifically the options shall illustrate streets, squares, and pedestrian ways that create a sense of 1.63

"campus" for the Proposed Project, that relate to the South End pattern of neighborhood squares in size and orientation, and that are not compromised by adjacency to service functions; these options shall be presented in site plans and site sections drawn at the scale of 1" = 40'.

2. Phasing plans showing the proposed buildings, infrastructure (streets, alleys, and pedestrian ways), and surface parking spaces at the end of each phase of project development; the Phase One plan showing buildings A and B shall include a similar proportion of the total proposed public open space and infrastructure; the phasing plans shall be presented in drawings at the scale of 1" = 40'. 1.64

3. A final build-out plan that shows no surface parking at the completion of the Proposed Project. 1.65

4. An elevation drawing of Albany Street at a scale of 1" = 20' or larger showing that all buildings have primary facades and main entrances facing Albany Street. 1.66

5. Eye-level perspective views showing what terminates the vistas looking south along the centerlines of East Concord, East Newton, and East Brookline Streets. 1.67

B. AGREEMENTS

In addition to completing the Development Review Requirements process, the agreements and plans listed below must be provided in form and content satisfactory to the appropriate signatory public agencies before building permits may be issued for the Project: 1.68

A) Master Plan and Development Plan pursuant to Section 3-1A of the Code;

B) Development Impact Project (DIP) Plan pursuant to Article 26A of the Code;

C) Development Impact Project (DIP) Agreement, including provisions for Jobs Contribution Grant and Housing Contribution Grant, pursuant to Articles 26A and 26B of the Code;

D) Land Disposition Agreement;

E) Cooperation Agreement pursuant to Section 31-14 of the Code;

F) Transportation Access Plan (TAP) Agreement;

G) Traffic Maintenance Plan in conformity with the City's Construction Management Program;

H) Boston Residents Construction Employment Plan, pursuant to Chapter 12 of the Ordinances of 1986 of the City of Boston, as amended by Chapter 17 of said Ordinances, and Executive Order Extending Boston Residents Job Policy, signed by the Mayor on July 12, 1985; and

I) First Source Agreement with the Mayor's Office of Jobs and Community Services.

PRELIMINARY ADEQUACY DETERMINATION - BOSTON REDEVELOPMENT AUTHORITY (PAD)

1.1 The project site includes approximately 372,593 s.f. or approximately 8.5 acres. The site and parcel surveys are available in Exhibits 2-5 through 2-8. Land acquisition is proposed in two phases. Phase 1 acquisition includes the development site discussed in this FPIR. Phase 2 involves an additional 5 acres for future development.

1.2 The landscape architect for the University Associates project is William Pressley and Associates. This is noted in Section 1.3, Project Development Team.

1.3 Land acquisition plans are found in Exhibit 2- 5 through 2-7 and are discussed in Section 2.6, Project Description.

1.4 The developer designation and land acquisition execution are discussed in Section 1.7, Evidence of Site Control.

1.5 Zoning relief is discussed in Section 1.8, Agency and Community Review Process. Zoning relief for the site is also presented in detail in the September 26, 1991 Master Planned Area/Development Impact Project Plan submission for the site.

1.6 See Preliminary Adequacy Determination (PAD) response 1.1 above.

1.7 Tax revenues associated with the University Associates project are discussed in Section 2.7, Community Benefits.

1.8 Additional analysis of potential impacts (air quality, noise, construction) on the daycare facility were conducted for the FPIR. The air quality is found to be adequate for sensitive receptors. Air quality at the proposed daycare center and play area is specifically discussed in Section 7.0, Air Quality. Other potential impacts regarding noise and construction were also found to be minimal. They are discussed in detail in Sections 8.0, Noise, and 12.0, Construction Impacts.

1.9 Mitigation measures relating to demolition of the existing overhead ramps associated with the construction of new Massachusetts Avenue are discussed in Section 12.0, Construction Impacts.

1.10 Out of 100 slots, twenty-three of the daycare slots will be made available to Boston City Hospital employees and 10 additional slots will be dedicated to local

residents who are not BUMC employees. Availability of daycare center slots is discussed in Section 2.7, Community Benefits.

1.11 Construction phasing is discussed in Section 2.8, Timetable, Phasing, Costs. Phasing of specific aspects of the development such as open space and infrastructure, is discussed in Section 2.6.1, Detailed Program Description. Phasing of parking during construction is presented in Section 6.3, Transportation Chapter.

1.12 CA/T impacts are discussed in Section 12.12, CA/T Construction. Site access and parking phasing are discussed in Section 2.6.1, Detailed Program Description. Parking phasing during construction is presented in Section 6.3, Transportation.

1.13 The phasing and cost estimates for the project are presented in Section 2.0, Detailed Project Description. Since the buildings are currently undergoing design, it is difficult to provide further detail than included in the PIR at this time.

1.14 Corrections are noted and can be found in their respective locations within the FPIR.

1.15 Shadow impacts are discussed in 3.0, Shadow Study and in the Blackstone/Franklin Square Neighborhood letter response 6.1 of this section, Responses to Comment Letters.

1.16 The University Associates project received a Certificate of Design Approval by the South End Landmarks District Commission on October 1, 1991. (See Appendix D, Approvals and Agreements.)

1.17 An analysis of impacts on the South End Historic District is presented in Section 4.5, Analysis of Potential Effects.

1.18 Please see Section 4.0, Historic Resources and Appendix E, Historic/ Archaeological Report.

1.19 A quantitative wind analysis has been conducted for the FPIR and is presented in Section 5.0, Wind Analysis.

1.20 Since the qualitative analysis was conducted, the landscape plan has been fully developed and will serve to effectively mitigate potential windy areas. Wind impacts and mitigation measures are discussed fully in Section 5.0, Wind Analysis.

1.21 The quantitative wind analysis includes the larger study area requested. The model and sensor locations for the quantitative wind analysis were reviewed an approved by the BRA on November 7, 1991 prior to the wind tunnel test.

1.22 These corrections are noted and can be found in their respective locations within the FPIR.

1.23 The TAP agreement is in the preliminary stages of discussion between the Boston Transportation Department and University Associates. This agreement will be finalized in early 1992.

1.24 This development project is planned as an extension of the Boston University Medical Center. Accordingly, some of the uses will not generate as many vehicle trips as they might were this to be a free-standing development project. Walk percentages for these uses were developed to reflect the nature of the hotel, serving patients and visitors to the two hospitals, and the nature of the research facilities, staffed by employees of the Boston University Medical Center, many of whom would walk between campus buildings.

1.25 Restaurant trip generation is included in the hotel trip generation rate as indicated in the Institute of Transportation Engineers, Trip Generation Manual, 4th Edition (land use code 310). In the manual, a hotel is defined, for the purposes of trip generation, as a place of lodging providing sleeping accommodations, restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, and other retail and service shops. The 180-seat restaurant included in the proposed development program is intended to serve visitors to the hotel as well as employees and visitors to the entire University Associates project.

1.26 It is estimated that the project will generate increased ridership of approximately 12% of total capacity of the five bus routes that service the area. A study is being conducted, with the cooperation of the MBTA, that will further analyze public transit options for the area. This study will examine existing conditions, provide suggestions for modifications to MBTA and shuttle routes, and provide a cooperative cost analysis. This is further discussed in Section 6.0, Transportation.

1.27 A formal pedestrian LOS analysis can only be conducted at signalized intersections. There is currently only one signalized intersection at the project site at East Newton Street. Furthermore, a pedestrian bridge is planned near this intersection. A pedestrian LOS analysis therefore was not conducted for this project. See Section 6.2.4, Pedestrians.

The project will generally create improved and safer pedestrian circulation. The pedestrian bridge over Albany Street will provide a new safer crossing from the site to The University Hospital. Existing pedestrian activity is light. The majority of new pedestrian trips is largely generated by the parking garage and these trips are kept within the project site. There will likely be some increase in daytime activity but this will not be a significant increase. See Section 6.3.7, Future Pedestrian Conditions.

1.28 This intersection has been further studied to identify additional measures to improve intersection operations. The results of this study and recommended improvements are included in the Transportation Mitigation Plan section of this report.

1.29 The DPIR documents that at three, not five, intersections, the LOS in either the morning peak hour or the evening peak hour will degrade between No-Build and Build conditions. These include two unsignalized intersections, Albany Street at East Brookline Street and Albany Street at East Concord Street, and one signalized intersection, Albany Street at Massachusetts Avenue. As indicated in the mitigation section of this chapter, the proponent is prepared to provide funding for the design and installation of traffic signals at both of the unsignalized intersections. This measure is expected to result in LOS A or B, which is better than existing conditions. At the signalized intersection of Albany Street and Massachusetts Avenue, the proposed extension of East Concord Street to the reconstructed Massachusetts Avenue Connector will result in changes in traffic patterns and an improved LOS C at Albany Street and Massachusetts Avenue during both peak periods.

It should be noted that these proposed intersection operations improvements are only part of the overall traffic mitigation plan proposed by University Associates. In addition to these operational improvements, travel demand management measures, which will be coordinated by the ITMA, will serve to further reduce the traffic volumes at these and other intersections within the study area.

1.30 The project site plan has been revised to relocate this loading dock. Based on this revised site plan, there will be no impact on the local street system due to truck backing or queuing. The revised loading plan is shown in Exhibit 6-21 in the section on Loading.

1.31 Access to and from the garage via Albany Street is provided by a service drive off Albany Street which is located north of the garage between East Concord Street and East Newton Street (see Exhibit 6-23).

1.32 Information on parking supply and demand during the project timetable is provided in the Construction Period Parking Impacts section of this chapter as well as in the parking replacement agreement between University Associates and Boston City Hospital.

1.33 The planned acquisition or construction of additional parking sites is discussed in Section 6.3.4, Construction Period Parking Impacts.

1.34 The current plan calls for the completion of the first three buildings (Boston University Center for Advanced Biomedical Research, the first parking garage, and The University Hospital medical office building) to be completed prior to the initiation of the reconstruction of the Massachusetts Avenue interchange, thereby leaving the parking currently under the expressway ramps in tact. The remainder of the development project will take place after the CA/T construction activities have been completed. During CA/T construction, it is likely that additional parking will be needed off-site to mitigate that project's impacts on BUMC parking supply. The ITMA has recently begun to work with the Massachusetts Department of Public Works to identify the extent of the potential impacts to BUMC's parking supply.

1.35 The only significant change to occur to BUMC complex on the west side of Albany Street is the relocation of some ambulatory patient parking from the existing Doctors' Office Building garage to the project site after the new medical office building is completed. The agreement between University Associates and BCH was reached last fall and is included as in Appendix F, Transportation.

1.36 During the construction of the first two buildings, patient and visitor parking on the site will be provided in the front portion of Lot A, near Albany Street. Once the garage is opened, the first level will be reserved for patient and visitor parking. Once the medical office building is opened, patient and visitor parking will be provided within the accompanying parking facility.

1.37 This comment is addressed in the future parking supply and demand relationship discussion in the Probable Project Impacts section.

1.38 The University Associates project plan includes the construction of 1,265 net new parking spaces on and adjacent to the site. These spaces will be included in structured parking facilities as detailed in the Full-Build Parking Conditions section of this chapter. No surface parking will be provided within the development site.

1.39 Massachusetts Turnpike users were assigned to I-93 northbound in the PM peak hour due to its ease of access from the site via Frontage Road (as opposed to traveling some distance on busy Massachusetts Avenue to Newbury Street) and its

traveling some distance on busy Massachusetts Avenue to Newbury Street) and its expected increase in capacity as a result of the Central Artery reconstruction. A total of 22 percent of project trips were assigned to the Massachusetts Turnpike. If half of these trips were to shift to Massachusetts Avenue from I- 93 northbound for their outbound trip, the net result would be an increase of 40 vehicles using Albany Street to turn right onto Massachusetts Avenue. This would have no significant impact on the predicted Full-Build condition level of service at this location because the southbound right turn is not a critical movement for operation at this intersection. It should be noted that 13 percent of the project-generated traffic was already routed onto Massachusetts Avenue west to account for use of this route from the west.

1.40 The analysis of this intersection was based on predicted traffic volumes based on CA/T forecasts. The improved LOS is a result of an anticipated decrease in traffic volume at this location. If CA/T plans are changed in a manner which impacts the predicted traffic volume, the LOS at this location may change accordingly.

1.41 The reason for the discontinuity is that the traffic networks are not balanced between these two intersections because four streets and the driveway from the large Flower Market parking lot intersect Albany Street between the two intersections.

1.42 Corrections

DPIR page 6-5 (first sentence) begins with an incomplete sentence. This was a result of a word processing error and has been corrected in this version of the document.

On DPIR page 6-14 (last sentence) the reference to Table 6-7 should have been Table 6-9. This has been corrected.

DPIR page 6-16 (first sentence) has been corrected to note that only 3 unsignalized intersections (not 4) operate at LOS D.

It should be noted that the Orange Line does not pass through the study area if the study area is defined as in DPIR Exhibit 72. Any reference to the Orange Line passing <u>through</u> the study area has been changed to <u>close by</u> the study area.

FPIR Exhibit 6-7 has been corrected to show that Bus Route 1 goes to Dudley Square.

1.43 See PAD response 1.8 above.

1.44 These corrections have been noted and can be found in their respective locations within the FPIR.

1.45 A complete discussion of traffic, exterior mechanical systems and construction noise impacts and mitigation can be found in Section 8.0, Noise.

1.46 Section 8.0, Noise includes a discussion of impacts and mitigation for the daycare center.

1.47 Total utility demand loads at Full-Build are provided in Table 9-2, Utility Demand Loads.

1.48 The ability of existing public utilities, such as water, sanitary sewer and storm drainage, to accommodate the load of the project has been confirmed by Boston Water and Sewer Commission staff. This is discussed in Section 9.0, Infrastructure and documented in Appendix H, Infrastructure.

1.49 Water flows have been retested since the DPIR and the results are presented in Section 9.2, Water System.

1.50 The Sanitary Sewer System, Exhibit 9-2, has been corrected and updated as requested.

1.51 Please see Exhibit 9-4 for updated telephone and electric service to the development site.

1.52 Water conservation measures are presented in Section 9.3, Water Conservation.

1.53 A discussion of protection of utilities during construction is included in Section 9.0, Infrastructure and Section 12.0, Construction Impacts.

1.54 Further site investigations and results are described in Section 10.0, Solid and Hazardous Wastes. Specific discussion of the daycare center is included.

1.55 Information regarding incineration operations and impacts will be made available by the user in accordance with the cooperative agreement.

1.56 Handling, transportation and reduction of excavation materials are discussed in Section 10.4, Operating and Disposal Plan. This is also detailed in the Excavation

Soils Materials Management Plan (ESMMP) for Building 2, Biomedical Research Building, which is found in Appendix J.

1.57 Fugitive dust will be mitigated by wetting areas which are not paved. This mitigation measure is included in Section 12.5, Construction Impact.

1.58 Use of sedimentation tanks during construction is described in Section 12.6, Construction Impact.

1.59 Pre-augering pile cavities will contribute to mitigation of noise/vibration due to construction activity. This is described in Sections 8.0, Noise, and 12.7, Construction Impact.

1.60 A discussion of CA/T construction mitigation measures is included in Section 12.12, CA/T Construction.

1.61 Poison-baiting for rodent control is discussed in Section 12.10, Construction Impact.

1.62 The Urban Design component of this report is contained in Section 2.0, Detailed Project Description.

1.63 The site master plan illustrates site elements, circulation, and the campus nature of the project and how it integrates into the South End fabric. This is found in Section 2.0, Detailed Project Description.

1.64 Project phasing of development features and infrastructure are presented in Section 2.6, Project Description.

1.65 Surface parking has been eliminated from the development program at Full-Build. This is referenced in Section 1.2.4, Changes Since the DPIR.

1.66 Selected elevations of Buildings 1 and 2 are presented in Exhibits 2-11 through 2-17. Large scale plans will be submitted independently of the FPIR.

1.67 Eye-level perspective views are included in Exhibits 2-26 through 2-31.

1.68 Appendix D contains Approvals and Agreements obtained thus far for the University Associates project.

2. MASSACHUSETTS HISTORICAL COMMISSION

From: Judith B. McDonough

Date: June 3, 1991

June 3, 1991

Secretary Susan Tierney
Executive Office of Environmental Affairs
100 Cambridge Street 20th Floor
Boston, MA 02202

Attn: MEPA Unit

Re: University Associates, 624-710 Albany Street, Boston, MA EOEA No. 7034

Dear Secretary Tierney:

The staff of the Massachusetts Historical Commission has reviewed the Draft Environmental Impact Report for the proposed project referenced above. The project site is located adjacent to the South End Historic District, which is listed on the State and National Registers of Historic Places and is a Boston Landmark, and is located within the South End Protection Area.

The staff of the MHC understand that the project proponent has been working with the Boston Landmarks Commission to assure that the proposed design is consistent with the guidelines for the area, and is sensitive to the adjacent landmark district. After a review of the materials submitted, I concur to a finding of no adverse effect for this action (950 CMR 71.07(2)(b)(2)).

If you should have any questions, please contact Maureen A. Cavanaugh of this office.

Sincerely,

Judith B. McDonough

Judith B. McDonough
Executive Director
State Historic Preservation Officer

cc: Boston Landmarks Commission
Massachusetts Department of Public Works
Fort Point Associates

Massachusetts Historical Commission, Judith B. McDonough, *Executive Director, State Historic Preservation Officer*
80 Boylston Street, Boston, Massachusetts 02116 (617) 727-8470

Office of the Secretary of State, Michael J. Connolly, *Secretary*

3. MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

From: Thomas F. McLoughlin, Public/Private Development Unit

Date: June 21, 1991

WILLIAM F. WELD
GOVERNOR

ARGEO PAUL CELLUCCI
LIEUTENANT GOVERNOR

RICHARD L. TAYLOR
SECRETARY

JAMES J. KERASIOTES
COMMISSIONER

Ten Park Plaza - Boston

File MRR 6/25/91

June 21, 1991

Susan Tierney, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street, 20th floor
Boston, MA 02202

Attn: Janet McCabe, Assistant Secretary

Subject: Boston - University Associates - DEIR
EOEA #7034

Dear Secretary Tierney:

Please find attached the MDPW comments on the Draft Environmental Impact Report for the University Associates project in Boston. If you or your staff have any questions regarding our comments, please call Shoab Rana of our office at (617) 973-7828.

Sincerely,

Thomas F. McLoughlin

Thomas F. McLoughlin, Director
Public/Private Development Unit

cc: Commissioner Kerasiotes
M. Swanson, Chief Engineer
M. Burke, Director BTP&D
A. Salamanca, DHE District 8
P. Anderson, Deputy Secretary, EOTC
R. Sloane, Assistant Secretary, EOTC

MDPW COMMENTS ON THE DEIR FOR
UNIVERSITY ASSOCIATES
BOSTON
EOEA #7034

The Draft Environmental Impact Report (DEIR) for the University Associates project identified above has been reviewed by the MDPW. The project is located on the east side of Albany Street south of Brookline Avenue, in Boston. The project entails the expansion of the existing Boston University Medical Center and consists of 660,000 square feet of new medical and general office space, 20,000 square feet of retail space, a 10,000 square-foot day care facility, and a 250 room hotel with an adjoining 180 seat restaurant. The project is expected to be completed by the year 2000 and will generate 4,706 vehicle-trips on an average weekday at full build-out. The site will also contain two parking garages with a combined total of 2,243 spaces.

The proponent has developed the background traffic volumes using a growth rate of 0.5 percent per annum in addition to the traffic volumes generated by all known developments within the study area. Whereas this seems reasonable it is not clear if the traffic forecast methodology, assumptions and the estimated traffic volumes used in the DEIR are consistent with the Central Artery/Third Harbor Tunnel (CA/THT) project. The proponent should confer with the CA/THT project staff and ensure that the traffic volumes used in these two projects are congruous. The FEIR should provide confirmation to this effect. 3.1

The Massachusetts Avenue/Melnea Cass Boulevard intersection continues to operate at LOS F in the PM peak hour even after the proposed mitigation. The FEIR should include analysis of additional mitigation measures to improve the LOS at this intersection to an acceptable level of service. 3.2

The DEIR traffic analysis relies heavily on the use of transit to access the site, and estimates that approximately 40 percent (1,880) of the new daily trips to the site will be made by transit. In order to realize this mode share the proponent has made a commitment to improving transit service in this area. The proponent has proposed to study the feasibility of a new bus route which would provide service from the project site to the Orange line at Ruggles station and to the Red line at Broadway station. The proponent should explore additional options including the expansion of medical area shuttle service in the FEIR. If the study finds that this transit route and additional options are feasible, the proponent should commit to implement these mitigation measures. The MDPW is pleased to note that the proponent has committed to formalize a Transportation Management Association (TMA) for the City Hospital area. 3.3

The proponent has proposed to extend East Concord Street to the Massachusetts Avenue connector. Given that the Massachusetts Avenue Connector, as presently designed by the MDPW does not have a break in access along the western side of the connector, the proposed extension of East Concord Street to the Massachusetts Avenue Connector may not be a feasible or desirable option. If this extension is not constructed, the project may have adverse impacts on the local roadways in the immediate vicinity of the project. The proponent should assess the project impacts without the proposed extension of East Concord Street. To minimize impacts at the Massachusetts Avenue Connector, the proponent should also analyze this intersection as right-turn-in/right-turn-out only. 3.4

Some roadway right-of-way is expected to become surplus due to the reconstruction of the Massachusetts Avenue Connector and I-93 ramps. This land is owned by the MDPW, however, the proponent has proposed to use it for portions of the development and for the extension of East Concord Street. Before filing the FEIR the proponent should consult with the MDPW Central Artery and Right-of-Way staff to explore the feasibility of using the surplus land as proposed in the DEIR. 3.5

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS (MDPW)

3.1 The proponent's transportation consultant has conferred with members of the CA/T team throughout the study process for the University Associates project. Existing and forecast traffic volumes developed for the CA/T project were obtained from the CA/T team. These data, prepared by the MDPW for the Supplemental Final Environmental Impact Statement (SFEIS) for the CA/T project, included total traffic volumes but did not include detailed turning movement volumes for the intersections within the University Associates study area. The CA/T data was used, however, to incorporate the changes anticipated to occur on arterial roadways such as Massachusetts Avenue and Albany Street. Therefore, the future traffic volumes are based upon the existing traffic volumes derived from earlier traffic counts, anticipated area developments, background growth, and traffic diversions associated with and obtained from the CA/T project and the SFEIS.

3.2 See Section 6.0, Transportation, for additional discussion of the Massachusetts Avenue/Melnea Cass Boulevard intersection.

3.3 See Section 6.0, Transportation, for discussion of the public transportation improvements feasibility study

3.4 The DEIR Build condition included an assessment of project impacts without the East Concord Street extension in place. The extension of East Concord Street was treated as a mitigation measure and was analyzed under the Build Mitigated Condition as presented in DEIR Tables 26 and 27. As shown in those tables, the East Concord Street Extension will benefit the intersection of Massachusetts Avenue and Albany Street most significantly by improving the level of service (LOS) during the morning peak hour from LOS D to LOS C and during the evening peak hour from LOS F to LOS C. The intersection of Massachusetts Avenue and Melnea Cass Boulevard remains deficient under Build and Build Mitigated conditions during the evening peak hour although there is a slight reduction in the volume-to-capacity ratio and the average intersection delay with mitigation in place.

See Section 6.0, Transportation, for analysis of right-turn-in/right-turn-out at the Massachusetts Avenue Connector/East Concord Street extension intersection.

3.5 The proponent has initiated discussions with the MDPW's Right-of-Way and Central Artery staff regarding the use of surplus land. Meeting notes in Appendix B, Correspondence and Meeting Minutes provide documentation of the discussions.

4. EXECUTIVE OFFICE OF TRANSPORTATION AND CONSTRUCTION

From: Richard L. Taylor, Secretary

Date: June 24, 1991

The Commonwealth of Massachusetts
Executive Office of Transportation & Construction
Office of the Secretary

William F. Weld
Governor
A. Paul Cellucci
Lieutenant Governor
Richard L. Taylor
Secretary

10 Park Plaza, Room 3510
Boston, MA 02116-3969
Telephone 973-7000
TDD (617) 973-7306
Telefax (617) 523-6454

RECEIVED
JUN 2 7 1991
MEPA
LATE COMMENT

EOTC #:91-0638

( )	ENF	#_____	( )	SUPP. DEIR	#_____
(x)	DEIR	#7034	( )	SUPP. FEIR	#_____
( )	FEIR	#_____	( )	TRAF. STUDY	#_____
( )	PROJ. CHANGE	#_____	( )	OTHER	

DATE RECEIVED: _____ COMMENTS DUE: 6-21-91

TOWN/CITY BOSTON, MASSACHUSETTS

PROJECT PROPONENT University Associates
Boston, MA

PROJECT DESCRIPTION: The proposed project involves a mixed-use development. It includes the construction of four medical research/office buildings, a 240 room hotel and a 1,000 car parking garage.

COMMENTS: (✓) YES ( ) NO

DATE:_____ _____
RICHARD L. TAYLOR,
SECRETARY

The Commonwealth of Massachusetts
Executive Office of Transportation & Construction
Office of the Secretary
10 Park Plaza, Room 3510
Boston, MA 02116-3969
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William F. Weld
Governor
A. Paul Cellucci
Lieutenant Governor
Richard L. Taylor
Secretary

EOTC COMMENTS ON THE DEIR FOR
UNIVERSITY ASSOCIATES
BOSTON, MA
EOEA #7034

EOTC has reviewed the DEIR for the University Associates project to be built within the Boston University Medical Center. The full-build proposal consists of three phases of construction with an estimated date of completion in the year 2000. The project will add to the medical center approximately 690,000 square feet of new medical and general office space, street level retail shops and a 250 room hotel with an adjoining 180 seat restaurant. The site will also contain two parking garages with a combined total of 2,243 spaces. The Phase 1 parking garage will be located at the corner of East Concord Street and Albany Street.

This site borders the existing Massachusetts Avenue Connector and the I-93 (Southeast Expressway) southbound ramps. As noted in the DEIR, the transportation network for this area will undergo a major upgrading as part of the Central Artery/Third Harbor Tunnel project. In addition to the improvements to the roadway network for this area, the MBTA is proposing to construct transit service to the area with the implementation of the Washington Street Replacement Service.

University Associates have proposed to extend East Concord Street to the reconstructed Massachusetts Avenue Connector. (4.1) East Concord Street would allow two-way traffic from the Massachusetts Avenue Connector to the garage entrance. Traffic from the garage access to Albany Street would be restricted to one way traffic traveling in the westerly direction only. This development related project would result in a new signalized intersection at East Concord Street/Massachusetts Avenue Connector. As presently designed by the MDPW, the Massachusetts Avenue Connector does not have a break in access along the western side of the Connector and it has no provisions for signalization at this new intersection. As part of the FEIR, the proponent should explore the traffic related impacts of the project without the extension of East Concord Street to the Massachusetts Avenue Connector.

A portion of the development site includes land that is owned by the Massachusetts Department of Public Works. With the reconstruction of the Mass Ave Connector and the I-93 Ramps, this project proposes to utilize surplus land resulting from the relocation of these roadways.

In order to explore the feasibility of the proponent's plans for the extension of East Concord Street and the usage of any surplus highway land in the immediate area, the proponents should consult with representatives from EOTC and the MDPW Central Artery Team before the filing of the FEIR. 4.2

According to the DEIR, this development will generate approximately 1,880 new transit trips per day. The proponent in conjunction with Metropolitan Structures is funding a study to explore the viability of instituting a new bus route to serve this site which would run from the Ruggles Orange Line Station to the Broadway Red Line Station. The feasibility study for the new bus service should contain a cost estimate for a pilot bus service which could be implemented to gauge the actual ridership for this proposed bus route. In the FEIR, the proponent should include an update on the feasibility study for this new bus route and a summary of ongoing discussions with representatives from the MBTA Construction and Operations Directorates. 4.3

As part of the transportation mitigation for this project, the proponent has committed to formalize a Transportation Management Association (TMA) for the City Hospital Area. The main role of the TMA will be to encourage greater use of public transportation options and the promotion of ridesharing among employees. This TMA will be sponsored by University Associates in conjunction with City Hospital, University Hospital and the BU Medical Campus. The TMA should explore the feasibility of sponsoring the proposed bus route from Ruggles Station to Broadway Station. This could be similar in nature to the MASCO sponsored bus service for the Longwood Medical Area. 4.4

06/19/91
tjr

EXECUTIVE OFFICE OF TRANSPORTATION AND CONSTRUCTION (EOTC)

4.1 See response to MDPW comment 3.4.

4.2 The proponent has initiated discussions with the MDPW's Right-of-Way and Central Artery staff regarding the use of surplus land. Meeting notes in Appendix B, Correspondence and Meeting Minutes, provide documentation of the discussions.

4.3 The feasibility study, which was initiated in July 1991, includes a data collection phase regarding ridership, travel times and existing transit services, and an analysis phase consisting of cost/benefit studies of demand forecasts and operating costs for both the MBTA and the institutions. The study process will be coordinated by the ITMA with the participation of representatives of the MBTA. As mentioned in Section 6.0, Transportation, ITMA has had ongoing discussions with MBTA staff regarding transit service improvements and will continue this dialogue throughout the course of this study. A meeting was held August 7, 1991 to review additional transit feasibility work. See Appendix B, Correspondence and Meeting Minutes for minutes to this meeting.

4.4 See Section 6.0, Transportation. The transit feasibility study is planned to include cost estimates for a pilot bus service and the feasibility of additional shuttle service sponsored by BUMC as suggested by EOTC.

5. BOSTON AREA BICYCLE COALITION

From: Anne L. McKinnon

Date: June 21, 1991

Boston Area Bicycle Coalition
P.O. Box 1015, Kendall Square Branch
Cambridge, Massachusetts 02142
(617) 491-RIDE

RECEIVED
JUN 24 1991
MEPA

June 21, 1991

Secretary Susan F. Tierney
Executive Office of Environmental Affairs
100 Cambridge St., 20th floor
Boston, MA 02202

Re: EOEA #7034, University Associates

Dear Secretary Tierney:

The Boston Area Bicycle Coalition (BABC), a non-profit, tax-exempt organization of cyclists dedicated to promoting bicycle use as a safe, practical, and enjoyable form of transportation, is pleased to be able to comment on this project. The BABC has worked with public agencies and private developers for over 15 years to address issues affecting bicycle use and access and to encourage them to promote bicycles as transportation by improving facilities during the design of a project.

The University Associates proposal for a mixed-use development on Albany Street in the South End will help define the South End boundaries and bring activity and pedestrian use to the Albany Street area. An improved streetscape with retail, trees and street furniture along Albany Street add life on the street and improve safety.

Because of the density of the development and the number of intersections that will have level-of-service E or F, it is clear that traffic mitigation, and specifically, promoting alternative transportation, is going to key to making this project work in terms traffic flow and congestion. The BABC is pleased to see that bicycles have been recognized as a viable transportation alternative and will be glad to assist the proponent in developing ways to encourage bicycle use by its tenants.

Research by the BABC has shown that there is a significant amount of bicycle traffic along circumferential routes in the Boston/Brookline/Cambridge area. It is clear that Boston commuters are less apt to take public transportation to a site that is not near radial transit facilities, largely due to the poor access that the existing crosstown buses provide (20-minute to 30-minute headways at peak) and the lack

of a high-frequency circumferential transit line. If commuters do not take transit to the site because of the relatively low-frequency service, they are more likely to drive. However, with the addition of small-scale measures that make bicycle commuting easier and safer, it is quite possible that some of those who would have driven would cycle instead, particularly since the site is located near an existing bicycle path on Melnea Cass Boulevard is near the Southwest Corridor Bikepath.

Therefore, in addition to suggesting that bicycle transportation be included in the "Transportation Awareness Days" and always mentioning bicycles in the pubic-awareness program on transportation options, the BABC would like to see the section on bicycles in the "Travel Demand Management Improvements" (p. 6-79) strengthened. The BABC suggests that there be commitments to providing one indoor bicycle parking space for every 10 automobile spaces provided and to include shower and locker facilities for cyclists. Further, we would like to see the proponent implement its bicycle parking program with many of the characteristics of the Cambridge Bicycle Parking Ordinance (see attached). Doing so would show a real commitment to promoting bicycles as transportation. 5.1

The BABC looks forward to seeing this project go forward and is willing to work with the proponent on bicycle-parking issues (design, location, etc.) and on access issues specifically related to the transportation mitigation measures. Thank you for the opportunity to comment.

Sincerely,

Anne L. McKinnon

Anne L. McKinnon

Cambridge Bicycle Parking Requirements

To encourage less use of automobiles, better facilities for alternate forms of transportation must be provided. Zoning ordinances in most cities already regulate the amount of parking required for buildings of various sizes and uses, so the additional requirement of safe, secure bicycle parking to those requirements seems only logical. Cambridge has integrated bicycle parking into the city's parking rules in a way which the BABC should encourage other communities, such as Boston, to emulate. When BABC member Gerry Degnen set out to get a copy of this ordinance, he discovered that the Cambridge City Clerk's office was not aware of its existence. It is safe to assume that relatively few developers and building managers are aware of the kind of bike parking they are required to provide. While this version of the law became effective only in 1987, we believe that an earlier version should cover most buildings built or renovated in the 1980's.

To encourage application of this ordinance in Cambridge and to encourage it's spread to other cities, here are some relevant excerpts from Article 6 of the zoning ordinances of the City of Cambridge, Massachusetts as enacted in October of 1987.

6.11 Intent. It is the intent of this Article 6.000 to reduce traffic congestion and thereby promote the safety and welfare of the republic, by establishing requirements for off-street parking and loading in conjunction with the use of land. The number of parking and loading spaces required herein varies according to type, location, and intensity of development in the different zoning districts, and to proximity of public transit facilities. This Article 6.000 requires development of adequate parking facilities to meet the reasonable needs of all building and land users without establishing regulations which unnecessarily encourage automobile usage. The parking standards contained herein are intended to encourage public transit, bicycle usage, and walking in lieu of automobiles where a choice of travel mode exists. It is also the purpose of this Article to allow flexibility in providing required parking through shared or off-site arrangements in order to accommodate the automobile in the urban environment in a less disruptive way. Development regulations and design standards have been established to reduce hazard to pedestrians on public sidewalks, to ensure the usefulness of parking and loading facilities, and where appropriate, to avoid potential adverse impacts on adjacent land uses and to enhance the visual quality of the city.

...

6.21 Use. All accessory parking facilities provided in accordance with this Article shall be maintained exclusively for the parking of motor vehicles or bicycles so long as the use exists which the facilities were designed to serve...

6.223 Accessory bicycle parking spaces required under the provisions of this Article 6.000 must be located in the same lot as the use being served or a contiguous lot in the same ownership.

...

6.31 Required Amount of Parking. Off-street parking facilities shall be provided for each use of a lot or structure in the amount specified in the schedule of parking requirements contained in subsection 6.36. Said schedule specifies the amount of accessory off-street parking required for each type of land use listed in Table of Use Regulations in this ordinance. The amount of required parking is also based on the intensity of development permitted in the district in which the use is located.

...

6.37 Bicycle Parking. Off-street parking of bicycles shall be provided as follows:

6.371 For multi-family residences there shall be one bicycle space or locker for each two dwelling units or portion thereof.

6.372 For all other uses, except those exempted in subsection 6.374, there shall be one bicycle parking space for each ten automobile parking spaces or fraction thereof required in subsection 6.36.

6.373 Uses allowed to have reduced parking by special permit under subsection 6.35 shall nevertheless be required to provide bicycle spaces in the amount of one for each ten automobile spaces or fraction thereof that would otherwise be required for such use in subsection 6.36.

6.374 No accessory bicycle parking shall be required to serve the following uses as listed in the Section 6.36. Schedule of Parking and Loading Requirements: [Townhouse or elderly oriented housing, cemeteries, mortuaries, veterinary establishments, kennels, pet shops, distribution centers, auto body or paint shops, and automotive repair garages.]

...

6.443 Off-street parking facilities shall be marked so as to indicate clearly the space to be occupied by each vehicle, in accordance with subsection 6.42 and including directional arrows and traffic signs as necessary for traffic control. Such markings shall be maintained so as to be plainly visible.

...

6.48 Lighting. Off-street parking facilities which are used at night shall be provided with adequate lighting.

6.49 Design of Bicycle Parking Spaces. Bicycle parking spaces shall be provided in accordance with the amounts required by Section 6.37 and with the design regulations in this section 6.49.

6.491 Each bicycle parking space shall be sufficient to accommodate a bicycle at least six (6) feet in length and two feet wide, and shall be provided with some form of stable frame permanently anchored to a foundation to which a bicycle frame and both wheels may be conveniently secured using a chain and padlock, locker, or other storage facilities which are convenient for storage and are reasonably secure from theft and vandalism. The separation of the bicycle parking spaces and the amount of corridor space shall be adequate for convenient access to every space when the parking facility is full.

6.492 When automobile parking spaces are provided in a structure, all required bicycle spaces shall be located inside that structure or shall be located in other areas protected from the weather. Bicycle parking spaces in parking structures shall be clearly marked as such and shall be separated from auto parking by some form of barrier to minimize the possibility of a parked bicycle being hit by a car.

6.493 Bicycle parking spaces shall be located near the entrance of use being served and within view of pedestrian traffic if possible, and shall be sufficiently secure to reasonably reduce the likelihood of bicycle theft.

6.494 Changes in the requirements of this section, consistent with the intent of this article may be approved by the Board of Zoning Appeal for an individual building by special permit.

6.51 Any application for a building permit for construction of a new building or for an alteration of an existing building increasing the gross floor area or intensity of use (as specified in subsection 6.21b), or for a certificate of occupancy where no building permit is required, shall be accompanied by one or more plans--drawn to scale and fully dimensioned--showing any parking and/or loading facilities to be provided.

6.52 Every such plan for a proposed new, altered, or expanded use which provides five or more parking spaces shall indicate thereon the location and provision for:

(1) parking spaces and access routes (6.34 and 6.40)
(2) curbing and wheel stops (6.442)
(3) pavement markings (6.443)
(4) surfacing (6.45)
(5) screening and landscaping (6.47 and 6.48)
(6) lighting (6.46)
(7) drainage (6.45)
(8) bicycle parking (6.49)
(9) loading areas (6.60)
(10) other pertinent data reasonably required by the Superintendent of Buildings or his designee.

BOSTON AREA BICYCLE COALITION (BABC)

5.1 University Associates will provide adequate and secure bicycle parking at various locations within the development project, including both indoor and outdoor facilities. The ITMA will seek the input of current bicyclists at member institutions in order to evaluate other amenities that would encourage use of this mode of transportation.

6. BLACKSTONE/FRANKLIN SQUARE NEIGHBORHOOD ASSOCIATION

From: James H. McQueen

Date: June 20, 1991

Blackstone/Franklin Square
Neighborhood Association, Inc.

RECEIVED
JUN 21 1991
MEPA

June 20, 1991

Secretary
Executive Office of Environmental Affairs
100 Cambridge Street, 20th Floor
Boston, MA 02202

Attn: MEPA Unit
Re: EOEA #7034

Dear Secretary:

Members of the Blackstone/Franklin Square Neighborhood Association have been actively involved in the ongoing review of University Associates proposed Albany Street project for the last six months. We generally support the development of this area as a medical research center and extension of the Boston University Hospital, however, we do have several serious reservations regarding the current design of the project. These reservations are as follows:

BUILDING HEIGHT AND MASSING: The present context of Albany Street consists of a collection of institutional, residential, and manufacturing buildings which, with the exception of the Dr. Solomon Carter Fuller Mental Health Center, average 65 feet in height. University Associates claim their design is in keeping with the height and massing of the buildings in this area (Article 2.6.3), however, the construction of a 144 foot tall building with an additional 24 feet of mechanical penthouse can hardly be termed sensitive to its neighbors. 6.1

The negative impact of this height is clearly illustrated in both the shadow and wind studies prepared for this project. Exhibits 36 through 46 indicate that Albany Street will be in continuous shadow from 9:00 AM until Noon for most of the year. Exhibits 69 through 71 indicate annual uncomfortable conditions along Albany Street/ 63% of the time wind velocities exceed 19 mph.

In response to this proposed design, and in fear of the precedents being established, the South End Master Plan Working Group, with the BRA, is proposing to lower the height limit for future buildings in the area and to initiate a 70' high set back requirement. This will allow for more sun on the street, and will mitigate the effects of the prevalent West and North-West winds. We suggest that similar mitigation measures be required for this project.

(bsfs003-1)

Post Office Box 940
Boston, Massachusetts 02118

Concerning the design of these buildings, we can only say that, this is an important public institution and design precedents should not be drawn from the manufacturing buildings of the area as suggested in exhibit 53.

PHASE II BRIDGE: Members of this neighborhood association have long objected to the termination of the streets' view corridors by the pedestrian bridges illustrated in Exhibits 6, 7, and 9. Not only are these bridges unattractive intrusions into the public domain, they also have the negative impact of reducing pedestrian activity on the streets and consequently reducing public safety. Active streets are safe streets. While we are aware of, and sensitive to, the Hospital's needs to transport patients under cover we, as residents, are more concerned for public safety. We suggest that wherever possible these bridges be eliminated or replaced with tunnels. 6.2

TRAFFIC: This project will contribute to the degradation of intersection level of service at three of the six signaled intersections surveyed (Tables 19 & 20). As shown by the No-Build Alternative this is not solely the responsibility of this development. However, it does create grave concerns for the residents of this area. We hope that you will stress full mitigation of this problem by the developers, the city and the state. 6.3

PARKING: Boston University Hospital has been sensitive to residents' concerns regarding parking in the past. However, the fact remains that staff and patients chose to park as far as six blocks away to avoid parking fees, thereby restricting residential and neighborhood business parking. We ask that appropriate measures be taken to counter this situation. 6.4

In conclusion, while we support the development of this area as a new medical research center and feel that such a development could be a benefit to the neighborhood, we do not support it in its present form. We hope that you will support us in our position. We will continue to work with University Associates to arrive at a mutually satisfactory design.

Sincerely,

James H. McQueen
Chair, Development Committee
Blackstone/Franklin Square Neighborhood Association

cc: University Associates
Don Giller

(bsfs003-2)

BLACKSTONE/FRANKLIN SQUARE NEIGHBORHOOD ASSOCIATION

6.1 The project design has continued to evolve and improve since the DPIR was submitted. The landscaping plan has been further developed in response to the qualitative wind analysis as well as other design concerns. As a result, all potential problem locations identified in the qualitative wind study have been effectively mitigated except for one location during the winter months which is off-site on Albany Street across from the Service Street. (See Section 5.0, Wind, for further discussion.) Additional mitigation measures can be investigated further if needed.

In developing a vacant site, the creation of net new shadows is unavoidable. For the University Associates project, the new shadows at pedestrian level principally affect Albany Street. The project has been laid out to minimize negative impacts and still achieve the desired program. Additional site planning has resulted in the opening up of the pedestrian plaza contributing some shadow relief to the plaza as well as creating better open space. While it is unfortunate that shadows are created, the project provides many design and safety benefits along Albany Street as well as offering substantial economic benefits to the area.

6.2 Safe pedestrian movement across Albany Street between The University Hospital and the medical office building (Building 3) is important to the operation of BUMC. A tunnel under Albany Street is not a feasible alternative, because of the extensive utilities under the street.

The proponent is sensitive to concerns about a pedestrian bridge over Albany Street. They have committed to working closely with the BRA and residents to develop a suitable design which will minimize visual impacts.

6.3 As stated in the DPIR, three of the six signalized intersections surveyed are expected to experience a decrease in level of service from existing conditions to Full-Build conditions during the evening peak hour. These three intersections are: Massachusetts Avenue and Harrison Avenue, Massachusetts Avenue and Albany Street, and Massachusetts Avenue and Melnea Cass Boulevard.

Of these three intersections, only one, Massachusetts Avenue and Albany Street, is predicted to decline in level of service (LOS E to LOS F) as a result of the University Associates project. Proposed traffic mitigation measures, including the extension of East Concord Street, are expected to improve this intersection to LOS C during the evening peak hour. In addition, demand management measures, which would serve to decrease traffic volumes traveling through this intersection, could further improve the future level of service.

The remaining two signalized intersections are expected to decline in level of service from existing to No-Build conditions as a result of regional growth, shifts in traffic patterns, and other planned development within the study area. The proponent has proposed improvements to the Massachusetts Avenue/Melnea Cass Boulevard intersection as discussed in response to MDPW comment 3.2. In addition, mitigation measures proposed by University Associates and coordinated by the ITMA will likely serve to improve traffic conditions throughout the study area by increasing the use of public transportation and consequently decreasing automobile use.

6.4 The proponent is continuing efforts to establish the Interinstitutional Transportation Management Association (ITMA) discussed in the DPIR in order to implement the comprehensive mitigation program outlined. The traffic management program includes efficient parking management and promotes alternative means of transportation. The proponent advocates that the City implement a resident parking permit restriction in residential areas around the medical institutions to discourage non-residential parking on local streets and encourage parking in designated lots.

Adequate on-site parking for patients and visitors will be supplied in convenient locations. The ITMA will further explore measures to better manage institutional parking such as with improved information signage, payroll deduction for employee parking, and other pricing measures. They will also encourage employees and visitors to park in institution-controlled facilities.

University Associates, through the ITMA, will encourage the City's Residential Permit Parking Program on residential streets in the Blackstone and Franklin Square areas and the installation of meters or other restrictions on non-residential streets. The ITMA also will work with the Boston Transportation Department to increase enforcement of on-street parking regulations.

7. BOSTON ENVIRONMENT DEPARTMENT

From: Lorraine M. Downey

Date: June 21, 1991

RECEIVED
JUN 19 1991
MEPA

City of Boston
The Environment
Department

Raymond L. Flynn
Mayor

Lorraine M. Downey
Director

Boston City Hall/Room 805
Boston, Massachusetts 02201
617/725-4416 or 725-3850

June 21, 1991

Secretary Susan Tierney
Executive Office of Environmental Affairs
100 Cambridge St. 20th Floor
Boston, MA 02202

Attn: Richard Foster
RE: EOEA #7034, University Associates, Boston

Dear Secretary Tierney:

The City of Boston Environment Department has reviewed the DEIR for the project referenced above and hereby submits the following comments in response thereto:

In general, the DEIR responds adequately to questions raised during earlier phases of the review process. The project will help revitalize an underutilized and currently somewhat blighted section of the South End, and as such should prove to be a positive long-term influence on the area. However, there are some issues which remain to be addressed, and some design refinements can and should be considered in the FEIR.

The project is located in the Harrison Ave./Albany St. Protection Area, adjacent to the South End Landmark District. The proposed setback will be reviewed for adequate landscape treatment by the South End Landmark District Commission. The Medical Research building exceeds the height standards for the Protection Area, and will be reviewed by the Commission as well. Although height restrictions may be waived under some circumstances, it is incumbent upon the project proponent to demonstrate a clear need for the excess height.

The project as proposed will cast shadows on East Brookline Street residences. The FEIR should continue to refine a mitigation package which reduces this project impact. 7.1

The FEIR should examine alternatives to the planned pedestrian bridge over Albany St. Methods of safely accommodating pedestrians without the bridge should be discussed, as well as potentially more attractive bridge designs. 7.2

The project proponent deserves praise for incorporating commuting by bicycle as a viable transportation option. This Department is encouraged to see a firm commitment to public transportation as well, and hopes the proponent will continue to move aggressively on encouraging use of transit, carpools, bicycles, and overall environmental sensitivity in transportation. 7.3

The FEIR should discuss the feasibility of relocating the day care center. As currently planned, the center is located under a garage and next to a busy thoroughfare. The DEIR does not include discussion of potential air quality problems in the day care center caused by the proximity to so many vehicles. 7.4

I thank you for your time and consideration.

Sincerely,

L M Downey

Lorraine M. Downey
Director

LMD/AP:ap

BOSTON ENVIRONMENT DEPARTMENT

7.1 See BFSN response 6.1

7.2 See BFSN response 6.2

7.3 The proponent is committed to promotion of alternative means of transportation as indicated in the Draft PIR and has progressed in establishing the ITMA. Furthermore, the proponent is working with the MBTA in developing a feasibility study for modification to the existing bus routes to better serve the South End medical area. If these changes prove feasible, the ITMA is committed to working with the MBTA and others to implement these transit improvements.

7.4 BUMC has a strong commitment to providing affordable daycare to its employees, particularly the underserved population which cannot easily afford quality services. Furthermore, BUMC has committed to allocating one third of the daycare slots to Boston City Hospital employees and local residents who are not employees of BUMC as described in Section 1.0, Project Description. While no subsidy program is planned, providing affordable, quality daycare is BUMC's primary goal. Toward this end, successful fundraising efforts have already taken place and will continue in the future.

BUMC currently has staff assigned to work with employees in meeting daycare and other family needs. BUMC is working with a consulting firm, Associated Daycare Corp., which specializes in the development of urban daycare facilities. BUMC is examining establishing a temporary facility until the permanent facility is built in Phase I of the University Associates project.

Many factors have been taken into account in locating the proposed daycare center. When all the factors are considered, the parking garage (Building I) best serves all the goals.

- **Timing** - The demand for the daycare facility is such that it needs to be available as soon as possible. Therefore, it is included in Phase I of the project.

- **Compatibility** - It is desirable to minimize conflicts with other tenants and/or activities in close proximity to the daycare facility. The garage offers the least variety of activities (parking and retail) which could conflict with the daycare center or pose potential hazards.

o **Amount of Space** - It is desirable to allocate enough space at the outset to provide for quality and meet demand. Other buildings in Phase I of the project do not have enough space on the ground level to accommodate daycare facility requirements to meet BUMC needs.

o **Access** - Easy access by car and walking is provided in the garage building.

o **Security** - The facility should be located where exposure to public activities and other people-oriented activities can be minimized. Since there are fewer activities occurring in the garage, there will be less exposure. The outdoor play area is also located in a relatively secure and secluded area within the complex, which is desirable.

o **Affordability** - Keeping the cost of construction down will contribute to the affordability of the daycare center to employees. The garage building offers the least expensive space within the project to establish the facility.

Until a permanent facility is ready, BUMC is in the process of arranging for a temporary daycare facility in the Bates School on Harrison Avenue.

In conclusion, BUMC is committed to providing substantial daycare for its employees. The University Associates project offers an opportunity to meet these goals. Safety and quality, as well as affordability, are high priorities which will be reflected in every aspect of design, orientation and operation.

Additional discussions of mitigation relating to the daycare center for air quality, noise, wind, solid and hazardous waste, and construction impacts are found in the corresponding sections.

8. MASSACHUSETTS WATER RESOURCES AUTHORITY

From: Katina N. Belezos

Date: June 21, 1991

MASSACHUSETTS WATER RESOURCES AUTHORITY
Charlestown Navy Yard
100 First Avenue
Boston, Massachusetts 02129

Telephone: (617) 242-6000
Facsimile: (617) 241-6070

June 21, 1991

Susan Tierney, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202

RECEIVED
JUN 21 1991
MEPA

Attn: MEPA Unit

Re: EOEA No. 7034 - University Associates DEIR, Boston

Dear Secretary Tierney:

Concerning the above-referenced Draft Environmental Impact Report (DEIR), we submit the following comments:

Wastewater issues are not adequately addressed by the proponent. The proponent has not performed an hydraulic analysis of the receiving sewers in the project area to determine whether or not adequate capacity exists to accommodate existing flows as well as the wastewater flow from this and any other proposed projects which will discharge to those sewers. We understand that Boston Water & Sewer Commission has done some sewer separation work in the area of the proposed project. The Final EIR should be updated to reflect those changes. In any case, stormwater and sanitary flows from the proposed project should be conveyed separately as far as possible. 8.1 8.2

While the proponent alludes to a water conservation program in the Project Summary section of the DEIR, no details of such a program are discussed elsewhere in the DEIR. As strict adherence to the Massachusetts Plumbing Code is a requirement and not a mitigation measure, the MWRA suggests that the proponent investigate additional measures to conserve water, i.e., air cooled or closed loop heating and air conditioning systems, water efficient plantings and minimum turf areas, etc., and include those in the FEIR. 8.3

The proponent should continue to coordinate with the Boston Water & Sewer Commission to assure consistency with all BW&SC requirements and policies. 8.4

We appreciate the opportunity to comment. Should you have any questions, please do not hesitate to call me at 242-0230, ext.4804.

Very Truly Yours,

Katina N. Belezos, Project Engineer
Planning Program

cc: Libby Blank, BW+SC

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MASSACHUSETTS WATER RESOURCES AUTHORITY

8.1 See Section 9.4, Infrastructure for handling of wastewater.

8.2 Sewer separation work is shown in Exhibit 9- 2.

8.3 See Section 9.3, Infrastructure for water conservation

8.4 Coordination with Boston Water and Sewer Commission is on-going.

9. BOSTON WATER AND SEWER COMMISSION

From: John P. Sullivan

Date: June 20, 1991

Boston Water and Sewer Commission

425 Summer Street
Boston, MA 02210-1700
617-330-9400
Fax 617-330-5167

June 20, 1991

Ms. Susan F. Tierney, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street, 20th Floor
Boston, MA 02202

Attn: MEPA Unit

Re: University Associates, DEIR/DPIR
EOEA No. 7034

Dear Ms. Tierney:

The Commission has reviewed the Draft Environmental Impact Report (DEIR) for the University Associates Project on Albany Street in Boston's South End.

The project is comprised of six buildings on a site currently used for surface parking by medical area employees and visitors. Construction is planned over three phases. The proposed buildings include a garage/day care/retail building, a medical building, a medical office building, two research/office buildings and a hotel.

The anticipated sanitary flow from the 1,177,300 square feet of building space is 120,810 gallons per day (gpd). The proposed domestic water demand is 157,620 gpd.

The Commission has made recent improvements to the sanitary sewers and storm drains in the project area. The proponent is advised to review the Commission's wastewater maps and construction drawings to revise the plan of existing and proposed sewers and drains, Exhibit 104. 9.1

The proponent is requested to respond to the following comments in the Final Environmental Impact report.

1. The proponent must determine the impact of the proposed project on the capacity available for the sanitary flow in the existing 66-inch x 68-inch sewer in Albany Street. Drawings of the New Albany Street Interceptor are available for review. 9.2

2. The South Branch of the New East Side Interceptor (NESI) must be plotted on the plan of proposed sewers and drains. The easements for the NESI, the drain on East Brookline Street Extension and the Roxbury Canal conduit should also be indicated. 9.3

3. Two future projects, the Central Artery/Third Harbor Tunnel and the Massachusetts Water Resources Authority's Combined Sewer Overflow Treatment Project will impact the storm drainage system in the project area. The proponent should evaluate the alternatives for drainage connections to either the 30-inch x 52-inch drain in Albany Street or directly to the Roxbury Canal Conduit. 9.4

The Commission is requesting that the proponent include water conservation measures in designing its new buildings. Within the buildings, efficient water use should be considered when selecting equipment or fixtures not covered by the plumbing code; such as, water cooled equipment. Outside the buildings, plants which are tolerant of drier conditions should be selected for landscaping. 9.5

The project proposes to use about 58,000 lbs/hr of high pressure steam service. The Commission would like to know where and how much steam condensate per day will be discharged. More information is requested on the use of steam; such as, the efforts made within the buildings to improve the efficiency of steam use, the feasibility of returning condensate to Boston Thermal Corporation and the potential for condensate reuse on the project site. 9.6

Thank you for the opportunity to comment on this project.

Yours truly,

John P. Sullivan, Jr., P.E.
Chief Engineer

JPS/PK/mo

cc: Patrick J. Foley - BWSC
Stephan Shea - BWSC
Jamie Fay - Fort Point Associates
Katina Belezos - MWRA

BOSTON WATER AND SEWER COMMISSION

9.1 See Exhibit 9-2, Sanitary Sewer and Storm, for updated sewer system plan.

9.2 See Section 9.4 in the Infrastructure Chapter for a discussion regarding adequacy of sanitary sewer system.

9.3 See Exhibit 9-2, Sanitary Sewer and Storm, showing the South End Branch of the New East Side Interceptor.

9.4 See Section 9.5 in the Infrastructure Chapter for impacts of the proposed project with other proposed projects on the storm drainage system.

9.5 See Section 9.3 of the Infrastructure Chapter for water conservation measures.

9.6 See Section 9.3.2 of the Infrastructure Chapter for feasibility of reuse of steam condensate.

10. BOSTON REDEVELOPMENT AUTHORITY

From: Paul Reavis

Date: June 20, 1991

BOSTON
REDEVELOPMENT
AUTHORITY

Raymond L. Flynn
Mayor

Stephen Coyle
Director

One City Hall Square
Boston, MA 02201
(617) 722-4300

6. 19. '91

Secretary Susan F. Tierney
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202

ATTENTION: MEPA UNIT

RE: EOEA #7034 - University Associates/Draft Environmental Impact Report

Dear Secretary Tierney:

Pursuant to regulations implementing M.G.L., Chapter 30, Sections 62-62H, the Boston Redevelopment Authority submits the following comments with regard to the above-referenced Environmental Impact Report:

In compliance with the requirements of Article 31 of the Boston Zoning Code, the Draft Environmental Impact Report for the University Associates development project in the South End section of Boston also will be filed as a Draft Project Impact Report. It is anticipated that this Project Impact Report will be submitted in the near future. The Boston Redevelopment Authority will review this Report under Article 31 procedures and will issue a Preliminary Adequacy Determination to the project proponent following the 30-day public review period. A copy of the Preliminary Adequacy Determination will be forwarded to your office at that time. 10.1

Sincerely,

Paul Reavis
Assistant Director for
Engineering and Design Services

cc: Robert Walsh
Walsh Associates

Jamie M. Fay
Fort Point Associates

Boston Redevelopment Authority is an Equal Opportunity/Affirmative Action Employer • Equal Housing Opportunity

BOSTON REDEVELOPMENT AUTHORITY

10.1 The proponent submitted a Draft PIR to the BRA on May 15, 1991 in accordance with Article 31. The public comment period on the Draft PIR ended July 25, 1991. A Determination of Adequacy was issued October 18, 1991. This FPIR has been prepared in response to the Adequacy Determination and comments received. See Subsection 1. of this section for responses to BRA Adequacy Determination on the DPIR.

11. METROPOLITAN AREA PLANNING COUNCIL

From: David C. Soule

Date: June 5, 1991

Metropolitan Area Planning Council
60 Temple Place, Boston, Massachusetts 02111 617/451-2770
MAPC
Serving 101 cities and towns in metropolitan Boston

RECEIVED
JUN 7 1991
MEPA

June 5, 1991

The Honorable Susan F. Tierney, Secretary
Executive Office of Environmental Affairs
MEPA Unit
100 Cambridge Street
Boston, MA 02202

Project Identification

Project Name: University Associates EOEA: 7034

Project Proponent: University Assoc. MAPC: DEIR-91-38

Location: Boston Received: 5/20/91

Dear Secretary Tierney:

The Metropolitan Area Planning Council regularly reviews development proposals deemed to have regional impacts. These proposals are reviewed for compliance with MetroPlan 2000, the regional plan for the Boston metropolitan area as well as for their impact upon the environment. The Council encourages MEPA to ensure that any proposed mitigation complies with MetroPlan 2000.

The plan for the expansion of the Boston University Medical Center conforms well with MetroPlan 2000 and the developer is to be commended for their sensitivity to pedestrians and their traffic management program. The treatment of Albany Street is excellent, the addition of shops, the day care center and the hotel will be an asset to the area. The only problem forseen is that the project essentially turns its back onto the Mass Ave. Connector. This makes sense in that the connector will be an auto rather than pedestrian

Franklin G. Ching, *President* Marjorie A. Davis, *Vice-President* Martha K. Gjesteby, *Secretary* Jay J. Donovan, *Treasurer*
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David C. Soule, *Executive Director*

dominated street. However, since the Mass Ave Connector side of the buildings will be fairly isolated, it doesn't make sense to locate a park and pedestrian terminus there. Considering the overall excellence of the plan this is a minor point, but one that should be addressed. 11.1

Sincerely,

David C. Soule

David C. Soule
Executive Director

DCS/KS/mlm
cc: Richard Dimino, MAPC Rep., Boston
Marc Webb, BRA
Kent Stasiowski, MAPC Staff
John Noorjanian, MAPC Staff

METROPOLITAN AREA PLANNING COUNCIL

11.1 The University Associates project is generally oriented toward Albany Street, but is envisioned by the community as a "gateway" to the South End. It is, therefore, desirable to provide an attractive view from the Massachusetts Avenue Connector. The open space and landscaping features on the Massachusetts Avenue side of the site serve this purpose and provide a buffer for the daycare play area and buildings. Landscape features and open space have also been provided in the pedestrian plaza and along Albany Street. The site open space has been modified to allow more internal area for the pedestrian plaza.

The location of the Roxbury Canal Conduit restricts development along the southern edge. Improvements to the project master plan are being revised with the community and BRA. The MAPC comments will be taken into consideration during this process.

APPENDICES

APPENDICES

Appendix A	Circulation List
Appendix B	Correspondence and Meeting Minutes
Appendix C	History of Boston University Medical Center
	Technical Appendices - Bound Separately
Appendix D	Approvals and Agreements
Appendix E	Historical/Archaeological Report
Appendix F	Transportation and Parking
Appendix G	Air Quality
Appendix H	Infrastructure
Appendix I	Wind
Appendix J	Excavated Soil Material Management Plan

APPENDIX A

CIRCULATION LIST

CIRCULATION LIST

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Braintree, MA 02184-9078

Ms. Liz Ferry
S.End News
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Boston, MA 02118

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State House
Room 33
Boston, MA 02133

Mr. David Queeley
MDC Planning Office
20 Somerset Street
Boston, MA 02108

Mr. Carl LeGrand
480 Hampden Street
Holyoke, MA 01040

APPENDIX B

CORRESPONDENCE AND MEETING MINUTES

Vanasse Hangen Brustlin, Inc.

Engineers,
Planners,
and
Scientists

VHB

101 Walnut Street
P.O. Box 9151
Watertown, MA 02272
617 924 1770
FAX 617 924 2286

☐ Memorandum ☐ Transmittal ☑ Meeting Notes ☐ Phone Notes

Date: August 6, 1991, 2:00 PM

Place: Robert Albee's Office
Central Artery/Tunnel
Headquarters

Attendees:
R. Hangen, W. Schwartz-VHB
R. Albee-MDPW
J. Greene-Rubin and Rudman

Project No.: 2825

Re: University Associates
Draft EIR Issues

This meeting was held at the request of the Executive Office of Transportation and Construction (EOTC) and the Massachusetts Department of Public Works (MDPW) to ensure that the University Associates development plans are not incompatible with the Central Artery/Tunnel (CA/T) project.

Bob Walsh explained the history of the development and described the phasing and proposed uses. The project is within an urban renewal district established in the late 1960s. Bob also explained that legislation exists that would enable the Commonwealth to turn over the land it currently owns along a portion of the site to the City of Boston for development purposes.

Bob Albee asked whether the land area that would become available after the completion of the CA/T project would be used for development. Bob Walsh said that University Associates would like to develop this parcel in the future. Bob Albee indicated the MDPW is viewing this site as a potential maintenance yard.

The Massachusetts Avenue Connector is being redesigned. In the revised version of the design, the main-line Southeast Expressway is at-grade and the connector road is on reclaimed fill. Slope easements for the connector road will now be required, possibly impacting the southwest corner of the development parcel. However, the connector road is shifting to the west and this may offset the slope easement. The plans will be finalized in a few weeks.

Jim Greene explained that the proponent has been working with Hamilton Wyche of the MDPW's Right-of-Way division with respect to land that is within the state highway layout but not in use. This land will be needed for the first phase of the development.

Bill Schwartz described the comments that were raised on the Draft Environmental Impact Report (EIR) by the MDPW and EOTC that related to the Massachusetts Avenue Connector and the proposed East Concord Street Extension.

Date: 8/6/91
Ref: 2825

Bob Albee indicated that the construction of a four-way intersection with the driveway to the Suffolk County House of Correction, the Massachusetts Avenue Connector and East Concord Street Extension does not appear to be a problem. He asked that the proponent's transportation consultant, VHB, contact Owen MacDonald of his staff to discuss the traffic analysis that was done.

The meeting adjourned at 3:15 PM.

HOWARD/STEIN-HUDSON ASSOCIATES

MINUTES OF MEETING

BUMC/BCH Interinstitutional TMA Meeting with MBTA to Discuss Albany Street/Melnea Cass Boulevard Bus Route Feasibility Study

720 Harrison Avenue, Room 1107
11:00 AM, August 7, 1991

In Attendance:

Don Giller, BUMC
Bernard Plotnick, BCH
Maureen Flaherty, ITMA
Alan Castaline, MBTA
Mark Guenard, MBTA
Jane Howard, Howard/Stein-Hudson Associates, Inc.

The purpose of this meeting was to discuss the feasibility study for a new bus route connecting Ruggles Station and Broadway Station via Melnea Cass Boulevard and Albany Street. Howard/Stein-Hudson Associates has been retained by University Associates to conduct this study, which was included in the University Associates Draft Environmental Impact Statement (May, 1991) as part of the Transportation Mitigation Plan for the proposed University Associates Development.

1. Purpose of the Study

Jane Howard from Howard/Stein-Hudson Associates introduced the meeting by explaining that the general goal of the study is to investigate transit improvements which will encourage increased transit use from the University Associates Development tenants, as well as from the Medical Area as a whole, and in particular to investigate a Ruggles/Broadway bus route via Albany Street and Cass Boulevard. This is an idea which has been proposed several times as a way of providing more visible and direct MBTA bus connections to the new development site and the medical area from the Orange and Red Lines, as well as to enhance the image and role of Albany Street as a transit link. Today, BUMC runs a shuttle bus to Broadway Station and BCH runs shuttles to Andrew and Ruggles. Each service allows employees for the other institutions to board.

2. Goals of the Various Participants

In examining the goals of the various participants, the following points were raised.

- Don Giller stated that BUMC's overall goal is to obtain improved transit service to the area, so that transit use can be encouraged. Today, employees, patients and visitors perceive that the service is too infrequent (particularly in off-peak hours), and that there has been a loss of service since Orange Line rapid transit service was removed from Washington Street. There is also a desire to link the area better with the Longwood Medical Area, with the proposed Ruggles Center development and with employers such as Gillette, to the north of Broadway Station.

- Bernard Plotnick of BCH stated that BCH wished to improve overall service to the area, and they hope this study supports efforts to improve the overall transit system, including the Washington St. replacement service. etc. He stated that BCH already runs two shuttles, one to Andrew and one to Ruggles for which good count data are available. BCH employees prefer the Andrew connection to the Red Line, since most come from the south, and many transfer from buses which connect

through Andrew and do not serve Broadway. He felt that rapid transit access and private shuttles will probably continue as the primary mode of public transportation into the future. Regarding bus routings, the current bus stop on Albany Street near the power plant is perceived as dangerous because it is difficult to cross the street, and there is no pedestrian phase for the signal. BCH has a "back door" onto Albany Street today, and will continue to do so in the future.

- Regarding the proposed Albany Street/Cass Boulevard route, Alan Castaline of the MBTA stated that there is no overwhelming reason to connect the Orange Line and the Red Line via a long bus route, since the direct transfer can probably be made more quickly in town. In addition, the area already has very good bus service, with five routes serving the area. If the desire is to provide service from each line into the area, separate routes from each station can probably serve the demand more effectively. If a new route were established in addition to the existing routes, it would have to be shown that the new route would not take riders from existing routes. This would require an extensive modelling effort. It might be that a look at modifying existing routes would be more productive. He said that although the new route had the advantage of being visible and simple to understand, it might have the disadvantage of less effective coverage of the area. This tradeoff would have to be weighed in the feasibility study.

  He said, however, that the MBTA has received requests recently from E. Concord St. residents in opposition to bus traffic on their street (Routes 10 and 47). In addition, requests have been received from merchants on Albany Street northeast of E. Brookline St. to have better service past their establishments. In particular, the Society for Prevention of Cruelty for Children has indicated a need for service in evening hours, when many clients visit. In response, the MBTA has considered extending the Route 47 (from which the Andrew leg has been cut for the past year and a half due to budget reasons) up to the MBTA Albany St. Garage where it could layover and turn around. Jane Howard suggested that these options could be looked at in the feasibility study.

  Alan Castaline went on to say that Andrew will be much more attractive as a transfer point once the ongoing reconstruction work is finished. Completion of the bus transfer area on surface is estimated around September, 1992, and the underground station sooner. At Broadway, there is less physical area in which to store or stop buses. Travel from the BUMC/BCH area to Broadway involves the northbound Frontage Road, which is unpredictable today as far as traffic congestion goes. This area will be negatively impacted by Central Artery/Tunnel construction as well. Finally, besides providing the transfer to the Red Line, Andrew also serves as a transfer point between buses, which implies both a cheaper pass cost, and elimina tion of an additional fare for one-time riders.

- Maureen Flaherty, Transportation Coordinator for the Interinstitutional Transportation Management Association (ITMA), said that although there are several routes, their patterns are confusing, since they travel on different streets. In addition, the headways between buses are long. Employees and visitors also want to know specifically when buses arrive in the area. With the various bus routes coming at different times, there is a choice of route for leaving the area. In other words, if a rider misses the #47 bus headed for Ruggles, he can take the #10 for Back Bay instead of waiting a long time for the next #47 bus. Without knowing exactly when each bus is expected, it is hard to know which route will come next. Alan Castaline said that the MBTA would supply a coordinated schedule of all bus routes in the area, with approximate times they reach the stops in the medical area. The ITMA has conducted employee surveys, and will conduct patient/visitor surveys in the fall. She also said that the need for bus connections to North and South Stations has been raised in the employee survey, although everyone agreed that it would be hard to find enough riders to justify such routes.

3. Study Scope and Proposed Methodology

Jane Howard then introduced the preliminary scope of the feasibility study. She said that will first to analyze existing conditions, and in particular ridership on existing Routes 47 and 10, which provide the Red Line and Ruggles Station Orange Line connections today. This will involve a brief interview at bus stops, boarding and alighting counts on the various MBTA and employer shuttle routes to the Orange and Red Lines and travel time studies. In the second part, a route and headways for the new service will be established, as well as as well as alternatives involving modification to existing MBTA and employer shuttle bus routes, which will be developed in cooperation with the MBTA. Then, operating characteristics, travel time, ridership, and cost/benefit estimates will be developed for the proposed bus route and the alternatives. Should a preferred route be agreed upon by the ITMA members and the MBTA, costs for a short-term demonstration will be developed as well. Comparative costs for MBTA operation versus private operation will also be developed.

4. Data Collection and Next Steps

It was agreed at the meeting that Jane Howard would meet separately with Mark Guenard at MBTA to discuss what MBTA data are currently available, and what data collection efforts would be compatible with ongoing MBTA surveys and methods. At this meeting, the MBTA ideas for modifying routes can also be mapped so that alternatives can be developed. Following this meeting, the scope for the study and the data collection efforts can be finalized.

BCH shuttle bus count data are available from Louis Daddario at BCH. Maureen Flaherty can make the ITMA employee survey data available, and supply information about the upcoming patient survey. The ITMA will also contact other area employers such as Digital, Gillette, and the Society for the Prevention of Cruelty to Children. Bill Gasper and John Sullivan can provide information about the BUMC shuttle bus ridership.

It was agreed that new data collection should not occur until after Labor Day, when the MBTA fall schedule goes into effect, and normal student, faculty, and staff activity patterns resume for the fall. This will give time to finalize a data collection plan and format which answers everyone's needs. Following the data collection, analyses and report preparation and review can proceed over the next six to eight weeks.

Mark Guenard asked if the ITMA will have a Transportation Awareness Day in the fall, since new students will be arriving, etc. Maureen Flaherty agreed that would be a good idea, and offered to do so. In response to the request for better schedule information, the MBTA agreed to have the consolidated schedule information ready for that time. Other devices such as a "You Are Here" map at bus stops were also discussed.

Finally, the group discussed the upcoming TMA meeting on September 12, which will be attended by Peter Calcaterra from the MBTA, who will discuss the Washington Street Replacement Service. Bernard Plotnick asked if the MBTA is still talking about Circumferential Transit service and whether there would be a stop in the medical area. Alan Castaline said that Peter Calcaterra could address the status of that study as well, but that this was a very long-term project.

RUBIN AND RUDMAN
COUNSELLORS AT LAW
50 ROWES WHARF
BOSTON, MASSACHUSETTS 02110

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BURTON PELTZ
MICHAEL L. ALTMAN
JANE ELIZABETH JONES
LEONARD M. DAVIDSON
DALE ANN KAISER
FREYA S. BERNSTEIN
DONALD J. QUILL
MARIANNE T. McCABE
MICHAEL K. CROSSEN
ROBERT J. MACK
MARK W. CORNER
DAVID C. FIXLER
SUZANNE L. KING
DIEDRE T. LAWRENCE
HELEN E. MORGAN
TIMOTHY R. EPP

STEPHEN C. FLASHENBERG
ALAN D. MANDL
SPECIAL COUNSEL

July 10, 1991

Mr. Joseph Fanale
Director
Right of Way Bureau
Department of Public Works
Ten Park Plaza
Room 6160
Boston, Massachusetts 02116

Re: University Associates
624-710 Albany Street, Boston
EOEA No. 7034

Dear Mr. Fanale:

I write you as counsel for University Associates in connection with a planned multi-use project to be located on Albany Street in the South End section of Boston. This project is described in a Draft Environmental Impact Report which has been submitted to the Executive Office of Environmental Affairs.

We have met with Mr. Thomas F. McLoughlin of the Department of Public Works in connection with a review of the overall project. Mr. McLoughlin suggested that we contact you in connection with a proposed acquisition of land owned by the Commonwealth of Massachusetts and controlled by the Department of Public Works. This land is an essential element of the project. Additionally, Mr. Bernard Baldassaro of your office suggested that I prepare a submission outlining not only the project but also the basis of the request for the acquisition of the state land. Therefore, please accept this letter as a formal request seeking the conveyance of a portion of land owned by the Commonwealth of Massachusetts to University Associates for this project.

The project site is known as Parcel 46B and is located within the South End Urban Renewal Area. Parcel 46B is now owned by the City of Boston and the Commonwealth of Massachusetts

and contains approximately nine acres on Albany Street with additional appurtenant rights adjacent to the Southeast Expressway and the Massachusetts Avenue Connector. University Associates has been designated as tentative redeveloper of Parcel 46B by the Boston Redevelopment Authority and has submitted to the BRA a Draft Project Impact Report pursuant to Article 31 of the Boston Zoning Code. The project consists of the phased construction of six major building components: a 1,000 car parking garage, a research building, a doctors' office building, two research laboratory/office buildings and a 240-room hotel. It is contemplated that the project will take approximately ten years to build and as such will be developed in phases. Phase I of the project includes the 1,000 car garage, the doctors' office building and the medical research building for Boston University Medical Center.

Parcel 46B is now used as a parking lot for Boston City Hospital, University Hospital and Boston University Medical Center and includes state land which was acquired by the Commonwealth for a sewerage and drainage system in the area of the Roxbury Canal and South Bay. Pursuant to Chapter 762 of the Acts of 1962, as amended by Chapter 567 of the Acts of 1966 (the "Act"), the Commonwealth was empowered to undertake certain storm water and sewerage system improvements in this area of Boston. The Act specifically provided for the acquisition of lands by the Commonwealth, the construction of such a system, and, upon completion of the system, the conveyance of the land to the City of Boston. The Act provided that the City would then convey the property to the Boston Redevelopment Authority for use within an urban renewal project or for development in accordance with the general plan of the City. I enclose a copy of the Act for your review.

As a point of reference, I also enclose with this letter a copy of the deed from the Commonwealth of Massachusetts to the City of Boston for adjacent property which is the discontinued portion of the state highway. The appropriate resolution and vote of the DPW referencing the discontinuance and realignment is also included. This parcel was in turn combined with City and BRA land and conveyed to the Independent Wholesale Florist and Suppliers Development Corporation by deed from the BRA on August 14, 1970. The 1968 Commonwealth deed references the authority of the second sentence of section 3 of the Act as well as the grant to the City in accordance with the provisions of the second sentence of Section 4 of the Act. It is our understanding that the Act is still an appropriate vehicle by which to convey land owned by the Commonwealth and which was contemplated by the

Urban Renewal Plan to be combined with City land for redevelopment purposes in the South End.

Bryant Associates has prepared for us a plan of land which shows the extent of the Commonwealth's ownership of land within the area of Parcel 46B. Portions of the Commonwealth's land includes land within the layouts of the state highway, which might not necessarily be needed for highway purposes due to the non-use of a portion of the present Massachusetts Avenue conector. Furthermore, it is our understanding that upon the completion of the Central Artery Tunnel project which includes the relocation of the Massachusetts Avenue Connector, additional areas of the Commonwealth's land which are now used for highway purposes, namely the present Massachusetts Avenue Connector, may no longer be necessary for highway purposes and thus be subject to the provisions of this Act. As part of the planning process for the redevelopment of Parcel 46B, the BRA and the City have contemplated the inclusion of this addltional land for development in accordance with a master planning process. It is contemplated that the inclusion of such additional land area will take place upon the completion of the Central Artery Tunnel project and the successful completion of Phase I and II of the University Associates project.

We would appreciate the opportunity of meeting with you so that we may review together the area of the project as well as the process of obtaining the approval of DPW for the incorporation of the state land through the application of chapter 762 of the Acts for Phases I and II of the development.

I look forward to hearing from you.

Very truly yours,

James H. Greene

JHG/mat
Enclosure

cc: Robert F. Walsh
Richard Towle
Michael Blaszyk

RUBIN AND RUDMAN
COUNSELLORS AT LAW
50 ROWES WHARF
BOSTON, MASSACHUSETTS 02110
TELEPHONE: (617) 330-7000
TELECOPIER: (617) 439-9556
GUTERMAN & GUTERMAN
FOUNDED 1920
GUTERMAN, HORVITZ
RUBIN & RUDMAN
1969-1985

STANLEY H. RUDMAN
HOWARD RUBIN
MILTON BORDWIN
MYRNA PUTZIGER
CHARLES J. SPELEOTIS
W. BRADLEY RYAN
PETER B. FINN
ANDREW J. NEWMAN
HAROLD STAHLER
MICHAEL R. COPPOCK
J. ROBERT CASEY
JOHN D. KALISH
RAYMOND M. KWASNICK
JASON A. SOKOLOV
ROBERT S. WALKER
DANA F. RODIN
LAWRENCE E. UCHILL
KENNETH M. BARNA
SELIG A. SALTZMAN
THOMAS R. KOLB
EDWARD R. ZAVAL
PETER F. GRANOFF
GENE T. BARTON, JR.
JONATHAN D. CANTER
ALAN K. POSNER
PHILIP L. SUSSLER
JACOB AARON ESHER
JAMES H. GREENE
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STEPHEN C. FLASHENBERG
ALAN D. MANDL
SPECIAL COUNSEL

July 30, 1991

Mr. Hamilton Wyche
Right of Way Bureau
Department of Public Works
Ten Park Plaza
Room 6160
Boston, Massachusetts 02116

Re: University Associates/State Land

Dear Mr. Wyche:

I write to you in connection with the request by University Associates to acquire through the operation of Chapter 762 of the Acts of 1962, as amended by Chapter 567 of the Acts of 1966, a portion of the state land which is adjacent to the Massachusetts Avenue Connector and Parcel 46B in the South End. During our conversation last week concerning my letter request of July 10, 1991, you had requested that I provide you with additional information which would be helpful in your review of this matter. In response to your request, I enclose the following materials:

1. A copy of the Boston Redevelopment Authority designation of University Associates as the redeveloper of Parcel 46B. This designation references the ownership of the parcel as the Commonwealth of Massachusetts and the City of Boston. Additionally, the designation includes a sketch of a site plan which depicts portions of City land and Commonwealth land.

2. A site plan prepared by Cambridge 7 Associates, Inc. dated May 1991 and included in the Draft Environmental Impact Report filed with MEPA. This site plan shows the proposed location of the new Massachusetts Avenue Connector as well as the existing ramp system which is marked in the dotted lines together with the discontinued northern portion of the present Massachusetts Avenue ramp. As shown the site plan,

the play area as well as landscaping, helicopter pad, parking areas are within the Massachusetts Avenue ramp which is no longer used for travel.

3. A copy of the Urban Renewal map which was an exhibit to the South End Urban Renewal Plan showing the location of land on Albany Street and Massachusetts Avenue which was to be acquired for development. Parcel 46B is located within such portion as well as the land upon which the existing Flower Mart complex is located.

As I mentioned in my letter of July 10, 1991, the Commonwealth conveyed a portion of the highway land to the City of Boston which in turn conveyed the land to the BRA, which conveyed the land to the Flower Mart developers for use in the assembly of the adjoining redevelopment parcels. We propose that the same process be utilized to enable University Associates to develop a medical research complex which is called for in the Urban Renewal Plan. As I indicated previously, we would be happy to sit down with you and go over other plans which our engineers, Bryant Associates, have prepared in connection with this development.

I look forward to hearing from you.

Very truly yours,

James H. Greene

JHG/mat
Enclosures

cc: Robert F. Walsh
William Schwartz
Jamie Faye

Boston Water and Sewer Commission

425 Summer Street
Boston, MA 02210-1700
617-330-9400
Fax 617-330-5167

May 22, 1991

Mr. Paul F. Pagnotti
Cosentini Associates
44 Brattle Street
Cambridge, MA 02138

RE: Hydrant Flow Tests
at 750 Albany Street, Boston

Dear Sir:

As per your request, we conducted two hydrant flow tests at 750 Albany Street, Boston, on May 8, 1991. The results are as follows:

<u>Test #1</u>	
Static	114.0 psi
Residual	87.0 psi
Flow	1553 gpm
Estimated quantity available @ 20 psi	3045 gpm
<u>Test #2</u>	
Static	64.0 psi
Residual	56.0 psi
Flow	3399 gpm
Estimated quantity available @ 20 psi	8533 gpm

I trust that this information is what you require. If I can be of further assistance, please feel free to call me.

Yours truly,

John P. Sullivan, Jr., P.E.
Chief Engineer

JPS/AC/mo

PRINTED ON RECYCLED PAPER

HYDRANT FLOW TEST REPORT

FRESH

Test Hydrant: 124-M20J Date: 5/ 8/1991 Time: 09:18

Location:

750 Albany Street Boston

Elevation: 18 ft Tester: Anne Lamb

Remarks:

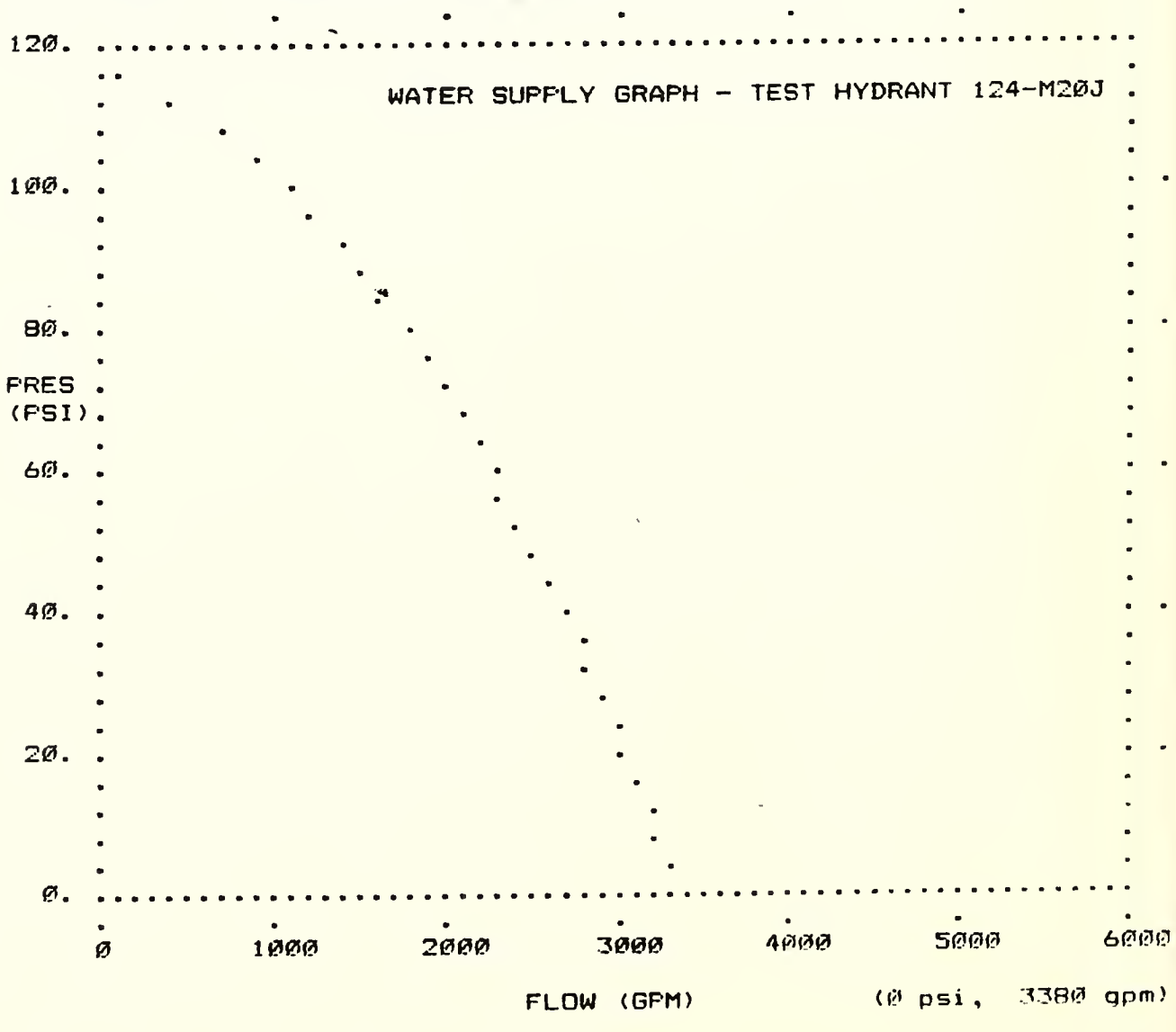
Test conducted on a southern high 1974 12 inch water main

Gage: S-2 Static Pressure: 114.0 psi Residual Pressure: 87.0 psi

FLOW HYDRANT	GAGE	DIAMETER	COEFFICIENT	PITOT	FLOW
152	A	2- 8/16 in	0.850	24.0 psi	776 gpm
152	A	2- 8/16 in	0.850	24.0 psi	776 gpm

Total Flow: 1553 gpm

Flow @20 psi: 3045 gpm Flow @10 psi: 3216 gpm



October 25, 1991
BAI #9103

MEMORANDUM

TO: Howard Goldberg

FROM: George McCarron

SUBJECT: Meeting with BWSC Re: Utilities (Water, Sanitary and Storm) at University Associates Medical Complex

On October 23, 1991, I met with Peter Wong of the BWSC and discussed utility services for the proposed project. Comments from Peter are as follows:

1. For a project of this size, BAI should ask Steve Shea, BWSC Director of Engineering Design, to assign a staff engineer to work with us and help coordinate the design effort.

2. Water - If a gridded, looped system is installed, BWSC will assume ownership and maintenance of the lines. If not, master water meters must be installed and the owner/developer would be responsible for the water piping up to the street line.

3. For the East Concord Street extension, which is to be a public way, a minimum size of 8" was suggested for a water line.

4. Storm Drainage - The removal of existing catchbasins and drains on the site which connect to either the Roxbury Canal Sewer or the drain in Albany Street, must be coordinated with the BWSC.

5. There are easements along the line of the Roxbury Canal Sewer and the East Side Interceptor which will require BWSC approval before any work is done in these areas.

6. Sanitary sewage from the project which will flow to the Albany Street main should be treated as sewer connections. 314CMR application for permit should be filed with appropriate authorities.

7. Storm runoff should be directed to either the Roxbury Canal Sewer or the Albany Street main. Work must be coordinated with BWSC.

GLM:mm

cc: Rayna Rubin (FPA)
Peter Wong (BWSC)

APPENDIX C

HISTORY OF BOSTON UNIVERSITY MEDICAL CENTER

technically a separate research institute, the Evans Department has always functioned as an integral part of the clinical care and training programs of the Hospital and the academic programs of the Division of Medicine of the School of Medicine. The Evans endowment has allowed the Hospital and the School of Medicine to be at the forefront of advances in medical education, research and clinical care.

During World War I, the Hospital formed a Base Hospital Unit, from which a large delegation of physicians and nurses were sent to France to treat wounded and ailing American servicemen. In 1929, recognizing that the Hospital was formed by a series of memorial buildings, and that homeopathy was no longer the predominant approach of most members of the medical staff, the Hospital changed its name to the Massachusetts Memorial Hospitals.

As a result of the leadership of Chester Scott Keefer, M.D., as physician-in-chief and director of the Evans Department, clinical research became a more central component of the Hospital mission in the late 1930s. In the 1940s and 1950s, many significant advances in the understanding and treatment of hypertension occurred at the Hospital and the School of Medicine.

In 1962, as described in Section 1.0, the Hospital and Boston University established Boston University Medical Center, joining resources and activities to meet the basic objectives of patient care, teaching and research. In 1965, to signify the Hospital's mission as a full-scaled teaching institution, the name of the Hospital was changed to The University Hospital.

In 1969-73, several modern facilities became operational. The Doctors Office Building, opened in 1969, provided on-campus facilities for practice by the Hospital's medical staff, as well as a means to expand Hospital outpatient services. The new Evans Building, the third research and patient-care facility built by the Evans endowment, opened in 1972. In 1973, the Health Services Building centralized clinical laboratory services and allowed the Hospital to expand its emergency department.

1.1 History of the Institutions

1.1.1 The University Hospital

The University Hospital is a 136-year-old Boston institution whose mission from the very beginning has been to provide clinical services, with the needs of the individual patient at the forefront.

The Hospital, now a regional academic hospital providing patient focused tertiary services, was founded in the 19th century as a much different kind of institution. Chartered in 1855 as the Massachusetts Homeopathic Hospital, the institution was sponsored by physicians who based their treatment of a disease on the idea that the appropriate kind of drug for treatment was that one which, particularly at a low dosage, mimicked the symptoms observed in the patient. This system of medical treatment, called "homeopathy," was a growing one in the last half of the 19th century, with centers in Germany and England in Europe and Boston and Philadelphia in the United States.

The Hospital began as a medical dispensary in downtown Boston and in the early 1870s opened its first inpatient unit. In 1875 the Hospital and the then-new Boston University School of Medicine established the Home Medical Service, through which medical students and their teachers became responsible for caring for patients in their own homes. A year later, through the influence of many physicians also associated with the School of Medicine, the Hospital relocated to a new building (known currently as the Talbot Building) on East Concord Street in the South End, adjacent to the School of Medicine.

A key event in the Hospital's history occurred with the 1910 endowment gift establishing the Robert Dawson Evans Memorial Department of Clinical Research and Preventive Medicine, to support clinical research, research training and public education. The Evans Department was one of the few research institutions of its kind when its activities began in 1912. Although

Planning for a new inpatient facility to consolidate and replace beds from antiquated facilities began in the late 1970s and culminated with the filing of a Determination of Need application with the state Department of Public Health in 1982. During the planning process, Hospital staff worked closely with neighbors and representatives of local agencies. As part of the public review process, three groups of local residents and businesspeople filed as "Ten Taxpayer Groups" to support the Hospital's requests. This was the first time in the modern regulatory process in which a Boston teaching hospital was publicly supported by its neighbors. The Hospital obtained approval for a new inpatient building and major renovation of older buildings in 1984.

Throughout the construction of its new facility, the Hospital maintained close and regular contact with abutters and other neighbors to mitigate any problems that might arise during construction.

With the opening of the Atrium Pavilion in late 1987, the Hospital provided its professional and support staff with first-quality facilities necessary to support the Hospital's patient-care mission. The Hospital acknowledged community support with a milestone "StreetFest '87" multicultural festival and block party, which attracted 5,000 people for tours, entertainment and international food.

In 1989-90, the Hospital initiated its so-called Change Project to prepare itself for hospital services in the 1990s. During this period, it accomplished major reductions in its expenses through operational and clinical reorganization and new buying practices, but with very few personnel reductions. At the same time, in mid 1990, the Board of Trustees adopted a new mission statement, a statement of values and goals (see below) that emphasizes "patient focus" as the unifying theme in the Hospital's commitment to patient care, research and education.

As a tertiary referral center with recognized subspecialties in adult medicine and a multidisciplinary team approach, the Hospital draws patients from throughout Massachusetts, the New England states, and New York. In addition, the hospital has a national reputation and attracts international patients as well. Unlike hospitals that provide a greater proportion of secondary care services, the Hospital, which relies on tertiary care referrals, draws patients from a large geographic area. As a result, the Hospital's principal service area is quite large, comprising the entire eastern half of Massachusetts. Specifically, the Hospital's service areas include Metropolitan Boston/Greater Boston, Southeastern Massachusetts, the Merrimack Valley and the North Shore. The municipalities within this service area include 190 cities and towns located within a radius of 50 miles from the Hospital. The geographic distribution of discharges has remained fairly constant since 1982. About 88 percent of the Hospital's discharges came from within the service area. Discharges from Massachusetts cities and towns outside the Hospital's service area represent about 3 percent of total discharges, while approximately 9 percent of total discharges are of patients who reside out of state.

History in brief:

1857 The corporators open the Homeopathic Medical Dispensary in Room 17 of Tremont Temple in downtown Boston, with a rotating staff of 16 physicians on hand to give free medical care to the needy.

1871 The Massachusetts Homeopathic Hospital opens at 14 Burroughs Place (behind the present Wang Center). The three-story Hospital has 16 beds, which immediately are filled, making it clear a new building must be constructed.

1875 The Hospital and Boston University School of Medicine work together to form what is now the oldest continuous Home Medical Service in the nation.

1876 The Hospital opens its new structure, the Talbot Building, in the South End. The new Hospital building is situated on land bounded by East Concord, Albany and Stoughton streets.

1884 A new surgical wing is added to the Talbot, allowing surgery to be done every day. Prior to 1884, operations were done on Saturday mornings in the School of Medicine's anatomical amphitheatre.

1885 The Hospital establishes a School of Nursing; the first class of 13 students is taught by four head nurses.

1897 Vose Hall, a nurses' residence, is erected in recognition of the importance of the School of Nursing in the work of the Hospital.

1910 The Evans Memorial Department of Clinical Research and Preventive Medicine is established through a series of gifts from Marie Antoinette Evans as a memorial to her husband, Robert Dawson Evans. The first Evans Building opens two years later.

1916 A gift from Wallace Fullam Robinson allows the Hospital to open the Jennie M. Robinson Memorial Building for maternity and outpatient care.

1917 World War I: The Hospital forms Base Hospital Unit #44, and a large delegation of physicians and nurses go to France to treat wounded and ailing American servicemen.

1929 The Hospital's name is changed to the Massachusetts Memorial Hospitals, in recognition of the fact that the Hospital is formed by a group of memorial buildings.

1936 With increasing need for additional space, the Hospital constructs the Helen Collamore Building adjacent to the Robinson Building, using funds left to the Hospital by Miss Collamore, a trustee.

1942 Under the direction of Chester Scott Keefer, M.D., the Evans Memorial Department of Clinical Research expands and a new Evans Building is opened.

1947 The Reginald Smithwick Foundation is established in appreciation of the work being done by Reginald Smithwick, M.D., surgeon-in-chief, in the treatment of hypertension and cardiovascular disease through surgery.

1962 Massachusetts Memorial Hospitals and Boston University establish Boston University Medical Center, joining resources and activities more effectively to meet the basic objectives of teaching, research and patient care.

1965 The name of Massachusetts Memorial Hospitals is changed to The University Hospital to clearly identify the Hospital's major commitment to medical education and research, as well as to patient care.

1969 The Doctors Office Building is completed.

1972 The new Evans Building, the third to be provided under the terms of the Evans endowment, opens its doors.

1973 The Health Services Building, centralizing patient-support services and allowing for an expansion of the Hospital's emergency department, opens.

1977 The University Hospital establishes the Evans Medical Group, a multispecialty outpatient medical service, emphasizing the continuity of a close doctor-patient relationship and introducing the concept of a primary-care physician.

1983 The Hospital renames its F Building the Preston Family Building in honor of the contribution of that family over three generations.

1984 Hospital trustees allocate general endowment funds to broaden the scope of the Smithwick Foundation for Surgical Advancement.

1984 The Commonwealth of Massachusetts Public Health Council grants approval to The University Hospital for the replacement of inpatient units located in its oldest buildings.

1987-8 The Atrium Pavilion opens its doors, forming the main entry to the Hospital and the Medical Center, and housing all of the Hospital's surgical facilities, as well as several medical units, the diagnostic imaging services, admissions department, and materials management and distribution, including a large offstreet loading dock.

1989 The Atrium Pavilion is recognized by *Modern Healthcare* magazine with the top international award for quality and innovation of design.

1989 On behalf of Boston University Medical Center, the Hospital coordinates the South End Medical Area Planning Study, which inventories all of the initiatives, public and private, that are likely to have an impact upon the Medical Center's neighborhood; and which provides recommendations on how these initiatives can be managed for mutual benefit and cause least disruption to area residents, institutions and businesses.

1991 The Hospital is named one of four Medicare Heart Bypass Centers by the federal Health Care Financing Administration.

The University Hospital's Mission

The mission of the University Hospital is to provide patient-focused, scientifically and technologically advanced health care. As the principal tertiary teaching and research hospital associated with Boston University, The University Hospital provides leadership and joins with others in delivering care, advancing clinical knowledge and educating health professionals. The Hospital serves the general health and well-being of a broad community and accomplishes its programs and services with respect for sound management and financial principles and concern for ethical standards.

The Hospital's Values

Our core beliefs that drive decisions and actions are as follows:
Quality Patient Care. We strive for the best in care and services for the individual patient by:

- encouraging innovation in the approach to clinical practices;
- developing and utilizing supportive new technologies;
- supporting opportunities for significant research whose results may lead to improvements in patient care and clinical outcomes.

We believe that by supporting compassionate, as well as expert, care, we are best able to provide quality patient care.

Respect for Others. We hold precious the dignity of those whom we serve and with whom we work. We value a supportive, personal environment for patients and their families, and for employees and all other health professionals, whether or not employed by our organization, who share in the responsibility and recognition for the care that we provide.

Collaboration and Cooperation. We affirm our commitment to reach out and work together with our institutional partners and neighbors within and adjoining Boston University Medical Center in developing coordinated approaches to shared challenges. We offer support to and seek the support of our community neighbors in working to improve the life of our community.

Responsibility for the Future. We value and support the education and training of future generations of health professionals.

Managing for Change. We constantly seek new approaches to improve the efficient management of our resources so that we can assure the effectiveness of our programs and services.

Institutional Goals

1. To provide leadership in the health-care community for efficient delivery of patient-focused care in a scientifically and technologically advanced environment.

2. To assure organizational structures and systems that support quality patient care and effective services as seen by the patient and that enable physician and nonphysician managers to be responsible and accountable for their clinical and administrative performance.
3. To strengthen and expand the network of University Hospital/Boston University affiliated hospitals and physicians in order to assert greater regional influence in patient care.

4. To foster the research activities within the Hospital to enhance the preeminence of the Hospital in patient care and advance clinical leadership within the medical community.

5. To maintain the Hospital's commitment to a strong academic relationship with Boston University's School of Medicine and Goldman School of Graduate Dentistry and encourage participation in the related health education and research programs of Boston University, Boston City Hospital, and other institutions.

6. To attract and generate the resources needed to meet current and long-term capital and operating requirements of the organization.

7. To contribute actively to the development of health policy at the local, state and federal levels.

1.1.2 Boston University School of Medicine

Boston University School of Medicine officially began classes for medical students in the autumn of 1873, following a merger with the New England Female Medical College, itself founded in 1848. The proximity of Boston City Hospital, and the intent of the Massachusetts Homeopathic Hospital to move to a site adjacent to the School of Medicine on East Concord Street in the South End, meant that a broadly based academic medical area was in place virtually from the start, with a vigorous community service component. The best and most enduring evidence of community-oriented medical education is the Home Medical Service, established

in 1875. Medical students supervised by School of Medicine faculty have been making house calls in the South End continuously for 116 years.

Chester Scott Keefer, M.D., who served as chairman of the Division of Medicine at the School of Medicine and physician-in-chief at the Hospital, invigorated the School's commitment to expansion of its research efforts, beginning in the late 1930s. Dr. Keefer himself was responsible for some of the earliest clinical studies of penicillin and oversaw its limited distribution among the civilian population during World War II. He later served as a medical adviser to President Dwight D. Eisenhower.

Dr. Keefer's successor as chairman of the Division of Medicine of the School of Medicine and physician-in-chief at the Hospital was Robert Wilkins, M.D. Dr. Wilkins led a research team that developed the first medical treatment for hypertension and established the foundation for the Medical Center's major programs in cardiovascular medicine.

In 1959, the School's first facility built exclusively for research, the Housman Medical Research Building, was opened, and it was expanded in the 1960s.

The 14-floor Instructional Building, which brought all of the preclinical and many of the clinical academic departments and functions under one roof, was completed in 1968.

Boston City Hospital and The University Hospital, along with the Boston Veterans Administration Medical Center in Jamaica Plain, are today the school's major teaching affiliates, although students receive additional clinical instruction and training at numerous affiliated community hospitals.

In the mid-1970s, the School began to encourage the development of centers representing concentrations of academic activity in specific areas. Since 1974, the following centers or institutes have been established: the Hubert H. Humphrey Cancer Research Center, the

Biophysics Institute, the Arthritis Center, the Health Policy Institute, the Whitaker Cardiovascular Institute, the Gerontology Center, the Center for Human Genetics, the Slone Epidemiology Unit, the Pulmonary Center and the General Clinical Research Center. These centers engage primarily in research and are almost entirely supported by grants and contracts from the federal government, foundations and corporations.

The School of Medicine offers various pathways to the M.D. degree, including a traditional four-year program. A seven-year program (with a six-year option), offered with the Boston University College of Liberal Arts, leads to the B.A. and M.D. degrees. Upon its establishment in 1960, this program was one of the first in the country to accept talented high-school graduates directly into a B.A.-M.D. pathway. A similar program, the Early Medical School Selection Program, has been developed to increase the minority physician population. The latter is based, in part, on the Modular Medical Integrated Curriculum (MMEDIC), introduced in 1977, which has won national recognition for decompressing the first two years of medical school using an integrated science curriculum that allows undergraduates to earn medical degree credit for certain basic science courses. In addition, the School of Medicine provides an alternative curriculum in which students may complete the first year of medical school in two academic years. The School of Medicine and the Division of Medical and Dental Sciences of Boston University's Graduate School offer combined programs leading to M.D. and Ph.D. degrees and to the M.D. and M.A. in Medical Sciences degrees. Programs leading to both M.D. and M.P.H. degrees and to M.D. and D.Sc. degrees are offered through the School of Medicine and its School of Public Health.

A substantial curriculum revision is now under way at the School. The revision is designed to reduce lecture hours, increase exposure to problem-based learning and computer-assisted instruction, and provide more clinical training in ambulatory care.

From the perspective of minority medical education, the School of Medicine has acted affirmatively for over a century. In addition to graduating the nation's first black female physician, Dr. Rebeccah Lee in 1872, it educated the nation's first black Secretary of Health and Human Services, Dr. Louis W. Sullivan, '58. An Office of Minority Affairs was established in 1972 and has helped the school maintain a record of minority enrollments at about 12 percent, well above the national average. An unusual agreement between a consortium of Historic Black Colleges and Universities signed in 1982 marked the beginning of the Early Medical School Selection Program. In this program, highly motivated premedical candidates at the participating colleges are accepted to the School of Medicine as college sophomores; they spend summers and the entire senior year taking MMEDIC courses and enter the School of Medicine familiar with the intellectual terrain, having already completed some requirements. This highly successful program now includes Native Americans, and it is being replicated elsewhere.

The Boston University School of Public Health, established in 1976 as a unit of the School of Medicine, has become a vigorous institution, producing many health care administrators, researchers and managers who now hold positions in state and local departments of public health, community health agencies, hospitals and clinics. The School of Public Health offers programs in environmental health, health services, health law and ethics, social and behavioral sciences, and epidemiology and biostatistics.

History in brief:

1873 Boston University School of Medicine is established through the acquisition by Boston University of the New England Female Medical College, itself opened in 1848. The first class had 131 students, 35 of them women. The founders of the School are committed to the principles and practice of homeopathy.

1875 The Home Medical Service is founded by the School of Medicine, in conjunction with the Hospital.

1918 The School's faculty votes that the School disaffiliate with homeopathy and become "nonsectarian."

1937 The world's first patent ductus operation, a forerunner of open-heart surgery, was performed by Dr. John Streider, a faculty member practicing at Boston City Hospital.

1948 The Framingham Heart Study is established by the federal government to monitor and evaluate the health status of 5,000 residents of Framingham, Mass. School of Medicine faculty members are key participants. When federal funding of this landmark epidemiologic study is compromised in 1971, Boston University School of Medicine mounts a successful fund-raising drive to maintain the continuity of the study. When federal funding is fully restored in 1973, the School of Medicine is credited with "saving" this important study.

1949 Dr. Robert Wilkins, professor of medicine, reports the development of the first medical treatment of hypertension.

1959 The School's first facility devoted to research, the Housman Medical Research Building, opens.

1960 The Six-Year A.B.-M.D. Program is established by the School of Medicine and the Boston University College of Liberal Arts.

1968 The Instructional Building and an expansion of the Housman Building are opened.

1972 The Office of Minority Affairs is established to enhance the recruitment, selection and retention of minorities as candidates for the M.D. degree.

1973 The City of Boston's Trustees of Health and Hospitals designate the School of Medicine as the sole provider of medical services at Boston City Hospital.

1973 The Boston University Cardiovascular Institute is founded to coordinate the broad array of research activities into cardiovascular disease and prevention.

1976 The School of Public Health is established as a unit of the School of Medicine.

1977 The Modular Medical Integrated Curriculum (MMEDIC) is established.

1979 The Hubert H. Humphrey Cancer Research Center is dedicated in memory of the late U.S. Vice President and Minnesota senator.

1982 The Early Medical School Selection Program is established in conjunction with a consortium of Historic Black Colleges and Universities.

1985 The Silvio O. Conte Medical Research Center is dedicated to honor the commitment of the U.S. Representative to biomedical research, medical education, and improved health care for all citizens.

1985 The first and only national research and demonstration center in hypertension funded by the National Institutes of Health is establised at the School of Medicine.

1988 The School of Medicine extends its research and academic programs to a facility at 801 Albany Street, developed in conjunction with the Community Development Corporation.

1989 The Cardiovascular Institute is renamed the Whitaker Cardiovascular Institute.

1989 Louis W. Sullivan, '58 and a former professor of medicine at the School of Medicine, is named U.S. Secretary of Health and Human Services.

The School of Medicine's Mission

The mission of Boston University School of Medicine is to educate and train physicians who will bring superior qualities to the everyday practice of medicine and biomedical research and who, at the same time, will possess unusual sensitivity to changes in the social, legal and economic climate that will affect the practice of medicine in the 21st century.

The education process is designed to provide instruction in biomedical sciences, phychosocial sciences, clinical medical sciences, history taking and physical diagnosis, and clinical medicine. In addition, students are expected to maintain a commitment to continuing medical education. Other specific objectives are to:

- Provide adequate and appropriate clinical experiences through strong affiliations with hospitals and health centers; and assure the continued improvement of health delivery in these facilities;
- Support innovative, broad-based programs which further the recruitment, retention and timely graduation of students from underrepresented ethnic minorities;
- Promote advanced biomedical research and disseminate findings to the medical community and the general public.
- Maintain a program of continuing medical education to assure that practicing physicians can stay abreast of current developments;
- Create an environment that encourages and fosters research in biomedical science, psychosocial science, health care delivery, public health, and international health;
- Meet the standards for accreditation by the Liaison Committee on Medical Education;
- Expand and strengthen the graduate training programs in the broad spectrum of clinical disciplines offered in the affiliated hospitals;

- Train graduate students in the division of Medical and Dental Sciences located within the School of Medicine;
- Train graduate students in public health in the School of Public Health located within the School of Medicine;
- Strengthen international programs which foster education, training and cooperation to improve medical care and public health in the developing world;
- Assure optimal exposure to computer technology so that students may graduate with a working knowledge of various computer systems and their application to the practice of medicine.

1.1.3 Henry M. Goldman School of Graduate Dentistry

The School of Graduate Dentistry is a 28-year-old Boston institution whose mission encompasses education, research and community service. The School of Graduate Dentistry was established in 1963, with origins dating back to 1958, when the School of Medicine established a Department of Stomatology to provide postdoctoral education in dentistry. At the time of its founding, the School of Graduate Dentistry was the only one in the country devoted solely to graduate-level education in the fields or oral surgery, orthodontics, periodontology, endodontics, pediatric dentistry, prosthodontics, oral pathology and dental public health.

The School of Graduate Dentistry developed rapidly, moving, in 1969, from its original site, a South End brownstone, to a modern, well-equipped facility. Under the leadership of Dean Henry M. Goldman, D.M.D., a pioneer in dental education, the School of Graduate Dentistry placed a strong emphasis on the relationship between dentistry and medicine in dental education and oral health. In 1978, following the retirement of Dr. Goldman, the Board of Trustees of Boston University named the school in honor of Dean Goldman.

Upon the foundation of strength in postdoctoral dental education, a predoctoral program, leading to a Doctor of Dental Medicine (D.M.D.) degree, was initiated in 1972; the curriculum continues to emphasize excellence in academics, clinical skills and research. Faculty at the

School of Graduate Dentistry have promoted an educational philosophy, now widely accepted, that a direct relationship must exist between the pre- and postdoctoral phases of dental education to enhance the art and science of dentistry. The School of Graduate Dentistry has also instituted several combined specialty programs, such as Pediatric Dentistry-Orthodontics, Prosthodontics-Periodontology, Orthodontics-Periodontology and Oral Biology.

The objectives of the School of Graduate Dentistry include not only the training of clinical specialists, but also the development of teachers and investigators in the clinical disciplines and basic sciences related to dentistry. The faculty consist of men and women who have distinguished themselves in education, research and patient care, and who, by their achievements, have helped to advance the profession of dentistry.

During the last decade, the School of Graduate Dentistry has seen impressive growth. With its development of the Booth Ambulatory Surgical Unit, the Prevention Center, the Division of Dental Research, the Career Resource Center, the Dental Placement Program, the Spencer N. Frankl Student Revolving Loan Fund and the APEX (Applied Professional Experience) Program, the School of Graduate Dentistry has augmented its services to both students and patients.

Throughout its existence, the School of Graduate Dentistry has demonstrated a sensitivity to the present and future needs of society and a desire to be responsive to these needs. Traditionally, students have been educated to become clinically proficient, prevention- and people-oriented dentists and dental specialists who are able to make contributions as members of the health care team. To this end, strong emphasis is placed on the responsibility of the students to prepare themselves professionally to meet the needs of the external environment. Through experiential learning in regional dental practices, extramural sites, educational facilities and a myriad of other training sites across the country, the School of Graduate Dentistry is dedicated to providing its students with optimum settings in which to acquire and strengthen their skills in diagnosis, patient and practice management, and other aspects of clinical postdoctoral

specialty education, as well as a complete range of dental programs and degrees, to about 470 students annually. The School of Graduate Dentistry has gained respect both nationally and internationally as an educational institution at the forefront of advancements in the field, and one that anticipates and responds to the needs of dental education.

History in brief:

1958 The Department of Stomatology is established at Boston University School of Medicine to provide postdoctoral education in dentistry.

1963 Boston University School of Graduate Dentistry is founded.

1969-70 Principal clinical teaching activities transfer to a new facility on East Newton Street.

1972 Building on the strong foundations of postdoctoral education, a predoctoral program is launched.

1975 School expands its East Newton Street facility to accommodate all of its teaching, research and clinical activities.

1977 Henry M. Goldman, D.M.D., retires as the founding Dean. A year later, the school is renamed the Henry M. Goldman School of Graduate Dentistry by the Trustees of Boston University.

1978 The School of Graduate Dentistry and Boston University's College of Liberal Arts initiate a combined A.B.-D.M.D. curriculum.

1979 The Booth Ambulatory Surgical Unit, providing outpatient surgical care, is established in conjunction with The University Hospital.

1980-83 The Prevention Center, the Extramural Program, and a dental plan for area college students are established.

1984 The Division of Dental Research is established.

1987-88 The Career Resource Center and the Dental Placement Program are introduced.

1989 The APEX (Applied Professional Experience) Program, offering an experiential component to the D.M.D. curriculum, is established.

The School of Graduate Dentistry's Mission

> The mission of the School of Graduate Dentistry is to provide superior education to dental professionals throughout their careers, to pursue advanced basic and clinical research in oral medicine, and to offer outstanding health care services to the community within a respectful and supportive environment. We accept responsibility for our role in shaping the future of dental medicine and continuously seek innovations in education, science, technology and health care management.
>
> *Goals*
>
> - To educate D.M.D. candidates to perform as qualified dental professionals (academic and clinical).
> - To educate postdoctoral residents to perform as qualified generalists or specialists.
> - To educate D.M.D. and postdoctoral candidates to pursue basic science and clinical science research on the academic level.
> - To instill in graduates the philosophy of life-long learning.
> - To improve the quality of education, research and service by supporting faculty development.

- To contribute to advances in oral biology and dental medicine by pursuing basic, applied and clinical research and disseminating important findings to the dental community.

- To provide quality, cost-effective, comprehensive, accessible dental care for children and adults, with emphasis on prevention, in an environment that supports compassionate and expert care. To provide this care by implementing innovative approaches to clinical practice, utilizing new technologies and supporting research that can improve patient care and outcomes.

- To maintain and improve our position in the Boston University community by reaching out and working together with all of the constituents of the Boston University Medical Center and Boston University in developing approaches to shared challenges.

- To maintain and improve the quality of education, research and service by seeking new approaches in managing for change and striving for efficiencies in managing our resources.

- To achieve all of our goals within an environment of support, trust, integrity and mutual respect.

1.2 Services Rendered by the Institutions

1.2.1 The University Hospital

With the exception of obstetrics, the Hospital provides a broad range of inpatient services and is especially noted for its tertiary care programs. Consequently, as a tertiary referral center with recognized specialties, the Hospital draws significant numbers of patients from numerous communities in Massachusetts and New England. The Hospital generates referrals and support from physicians located in these communities, and from affiliated community hospitals.

All members of the Hospital's active medical staff are members of the faculty of either the School of Medicine and/or the School of Graduate Dentistry, and the service chiefs of the

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